The PHOTOFACT Servicer

SET 466 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ DEC., 1959

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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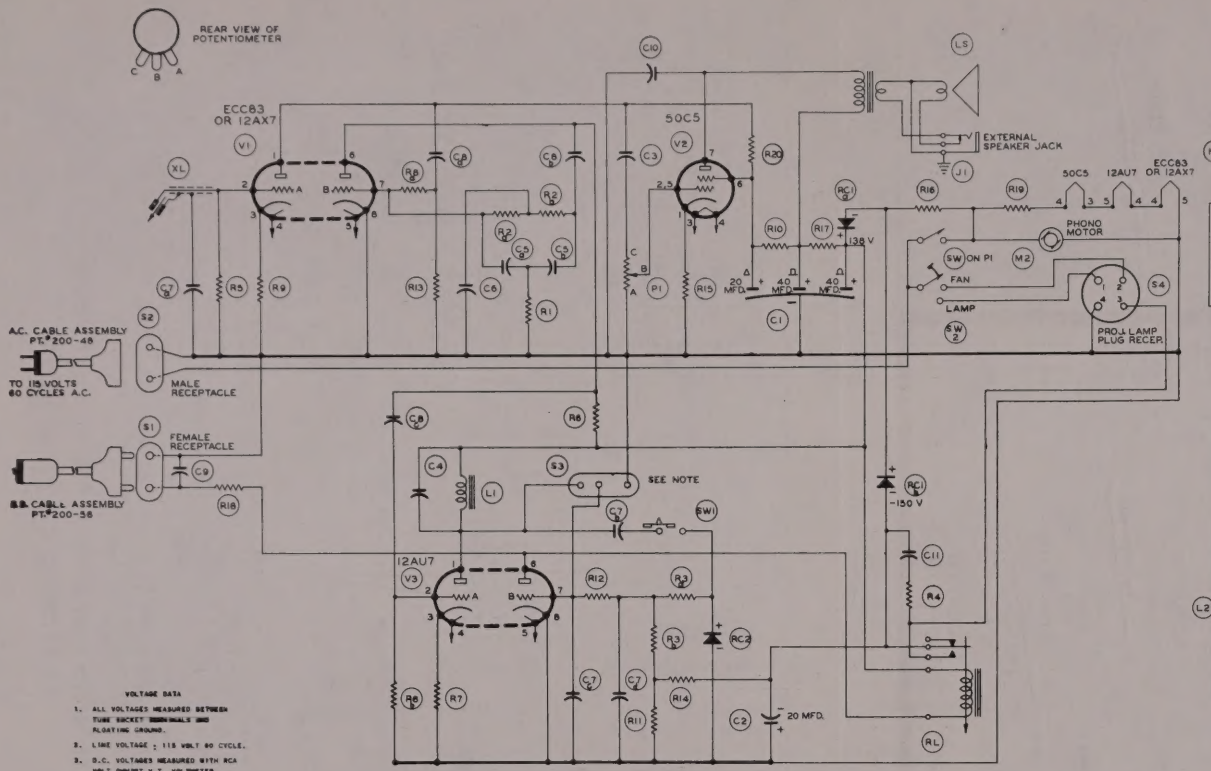
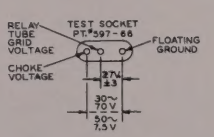


VOLTAGE DATA

1. ALL VOLTAGES MEASURED BETWEEN TUBE SOCKET TERMINALS AND ALOGATING GROUND.
2. LINE VOLTAGE = 115 VOLT 60 CYCLE.
3. D.C. VOLTAGES MEASURED WITH RCA VOLT OHM MET V.T. VOLTMETER.
4. A.C. VOLTAGES MEASURED WITH A BALLANTINE MODEL #643.
5. VOLTAGES MAY VARY WITH DIFFERENT TUBES, BUT SHOULD BE SUBSTANTIALLY 20% ACCURATE.
6. VOLUME CONTROL MAXIMUM.
7. AUTOMATIC MANUAL SWITCH IN AUTOMATIC POSITION.
8. A.C. 30 CYCLE INPUT + AND A.C. 50 CYCLE INPUT VOLTAGES ARE MEASURED WHILE STANDARD RECORDING #404-5 IS BEING PLAYED.



TUBE VOLTAGES

TUBE TYPE		SOCKET PIN NUMBER 1	2	3	4	5	6	7	8	9
V1 ECC83/12AX7	D.C. NO SIGNAL	92					72	-.6		
	A.C. 30~ INPUT	3.4	.16				12	.20		
	A.C. 50~ INPUT	2.6					1.9	.042		
V2 50C5	D.C. NO SIGNAL	7.6					112	116		
	A.C. 30~ INPUT									
	A.C. 50~ INPUT									
V3 12AU7	D.C. NO SIGNAL	136		6			138	-27		
	A.C. 30~ INPUT	70	10					0		
	A.C. 50~ INPUT	7.5	1.8					-25		

NOTE:

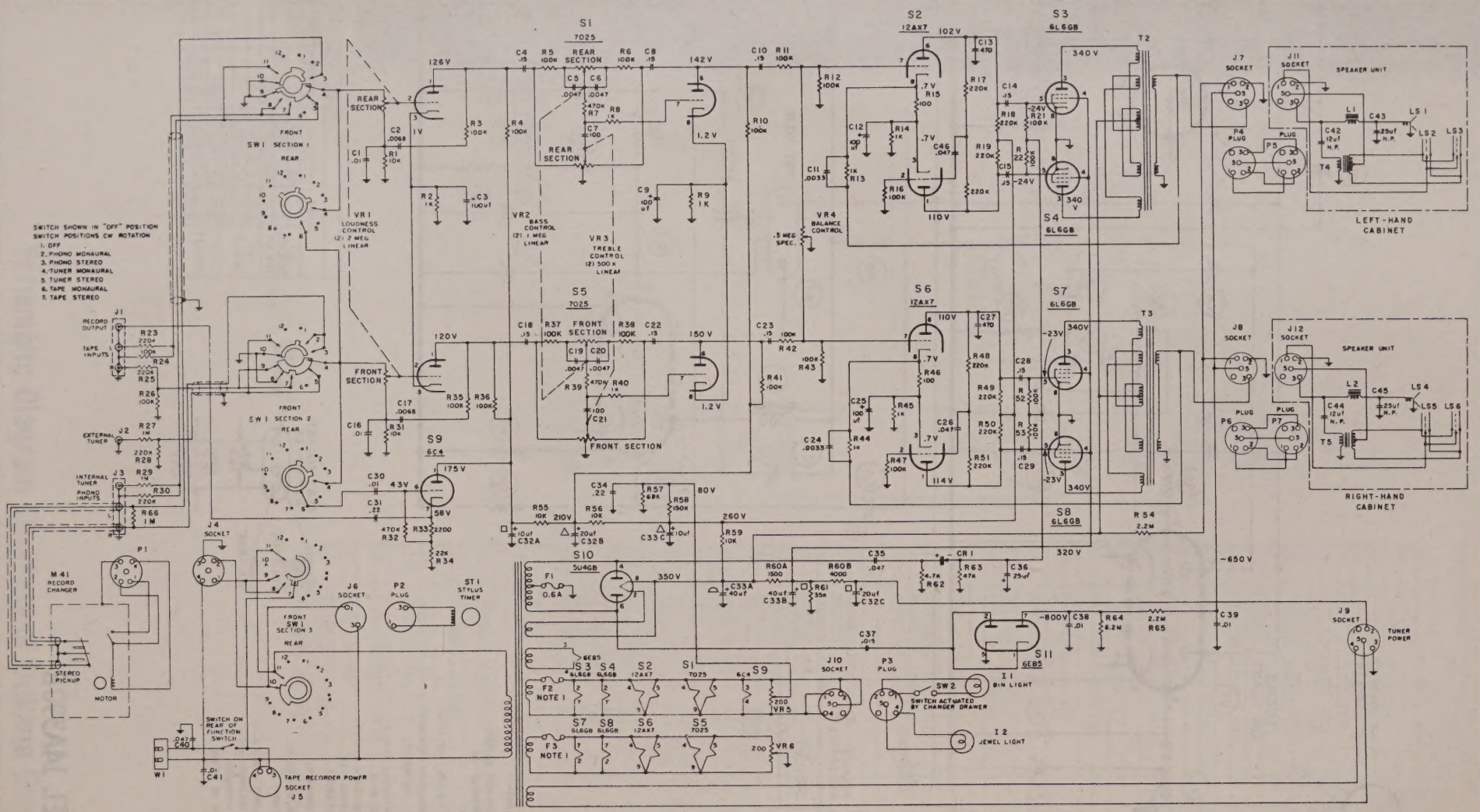
S3. RECEPTACLE - 3 PRONG, IS NOT SUPPLIED WITH A TEST PLUG, - ALDEN PT# HA803-P

LIST OF ELECTRICAL PARTS

DES.	DESCRIPTION	QTY.	PART NO.
C1	CAPACITOR - ELECTROLYTIC 40-40-20 MFD., 150V.	1	199-2951
C2	CAPACITOR 20 MFD. 200V.	1	199-2952
C3	CAPACITOR .0033 MFD. 500V.	1	199-1003-332
C4	CAPACITOR .5 MFD. 200V.	1	199-4013-504
C5	CAPACITOR .01 MFD. 200V.	2	199-4016-103
C6	CAPACITOR .02 MFD. 200V.	1	199-4016-203
C7	CAPACITOR .1 MFD. 200V.	4	199-4017-104
C8	CAPACITOR .047 MFD. 200V.	3	199-4017-473
C9	CAPACITOR .03 MFD. 400V.	1	199-4021-303
C10	CAPACITOR .022 MFD. 400V.	1	199-4026-223
C11	CAPACITOR .047 MFD. 400V.	1	199-4026-473
V1	ELECTRON TUBE	1	262-ECC83/12AX7
V2	ELECTRON TUBE	1	262-50C5
V3	ELECTRON TUBE	1	262-12AU7
J1	JACK - FOR EXTERNAL SPKR.	1	415-4
PL1	PLUG - PROJECTOR LAMP	1	570-3032
L1	REACTOR - AUDIO	1	583-12
RC1	RECTIFIER - SELENIUM 100 MA.	2	595-30
RC2	RECTIFIER - SELENIUM 10 MA.	1	595-31
RL	RELAY - S.P.D.T. 3000 OHM	1	598-92
S1	RECEPTACLE - PUSH BUTTON	1	587-40
S2	RECEPTACLE - MALE A.C.	1	597-81
S3	RECEPTACLE - 3 PRONG TEST	1	597-66
R1	RESISTOR 330 K OHM 1/2W	1	600-0073-334
R2	RESISTOR 510K OHM 1/2W	2	600-0073-514
R3	RESISTOR 1.2 MEG OHM 1/2W	2	600-0080-125
R4	RESISTOR 150 OHM 1/2W	1	600-0080-151
R5	RESISTOR 1.5 MEG OHM 1/2W	1	600-0080-155
R6	RESISTOR 180K OHM 1/2W	1	600-0080-184
R7	RESISTOR 2700 OHM 1/2W	1	600-0080-272
R8	RESISTOR 2.7 MEG OHM 1/2W	3	600-0080-275
R9	RESISTOR 3300 OHM 1/2W	1	600-0080-332
R10	RESISTOR 4700 OHM 1/2W	1	600-0080-472
R11	RESISTOR 47K OHM 1/2W	1	600-0080-473
R12	RESISTOR 470K OHM 1/2W	1	600-0080-474
R13	RESISTOR 4.7 MEG OHM 1/2W	1	600-0080-475
R14	RESISTOR 68K OHM 1/2W	1	600-0080-683
R15	RESISTOR 150 OHM 1W	1	600-0116-151
R16	RESISTOR 22 OHM 1W	1	600-0116-220
R17	RESISTOR 220 OHM 1W	1	600-0116-221
R18	RESISTOR 6800 OHM 1W	1	600-0116-682
R19	RESISTOR 300 OHM 10W	1	600-1015-301
R20	RESISTOR 100K OHM 1/2 W	1	600-0080-104
P1	POTENTIOMETER .5 MEG. W/SW	1	601-110
S4	SOCKET - FOR PROJECTOR	1	633-03-08818
L2	INDUCTANCE - SOLENOID	1	639-1
SW1	SWITCH - SLIDE S.P.S.T.	1	680-23
SW2	SWITCH - TOGGLE 3 POS.	1	680-248
XL	PICKUP CARTRIDGE - CERAMIC	1	983-99
M1	MOTOR - BLOWER	1	494-41
M2	MOTOR - PHONO	1	494-50
N1	PROJECTOR LAMP 300W.	1	456-30
LS	LOUDSPEAKER AND TRANS.	1	5-11088

DUKANE MODEL 14A390B

Schematic Diagram Courtesy of Dukane Corporation



1. Fuse wire, approximately 2½" of number 26 AWG copper in a fiber glass sleeve.
2. All voltages measured with the tuner disconnected and no signal input.
3 All voltages measured with a VTVM.

For Service Information on AM/FM Tuner RT-202-3

(See Photofact Folder 17 In Set 464)

PHILCO MODEL G-1909S

Schematic Diagram Courtesy of Philco Corporation

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

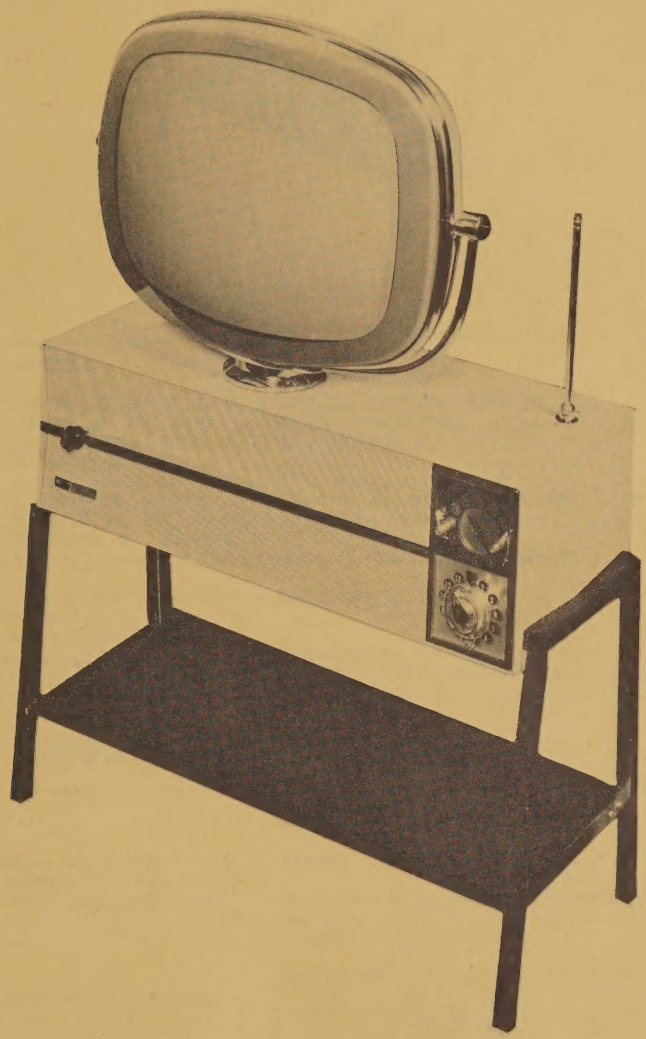
PHILCO CHASSIS 10L41, U, 10L42, U, 10L43, U

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PHILCO CHASSIS 10L41, U, 10L42, U, 10L43, U



MODEL H3412L (Ch. 10L43)

PHILCO CHASSIS 10L41, U, 10L42, U, 10L43, U

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PHILCO CHASSIS 10L41, U, 10L42, U, 10L43, U

PHILCO CHASSIS 10L41, U, 10L42, U, 10L43, U

MODEL H3412L (Ch. 10L43)

TRADE NAME	Philco	MODELS	CHASSIS
		H4254S, SL, H4674, L, W, H4676S, SL, H4678, W, H4680, L, W, H4682S, SL, SW, H4690, P, H4692W, H4696S, SW	10L41
		H4676SLR, SR, H4680LR, R, WR, H4690PR, R, H4692WR, H4698PR, R	10L42
		H3408C, H3410, L, V, H3412GL, L, H4432, L, H4730, W	10L43
		UH4254S, SL, UH4674, L, W, UH4676S, SL, UH4678, W, UH4680, L, W, UH4682S, SL, SW, UH4690, P, UH4692W, UH4696S, SW	10L41U
		UH4690PR, R, UH4698PR, R	10L42U
		UH3408C, UH3410, L, V, UH3412GL, L, UH4432, L, UH4730, W	10L43U
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.		
TYPE SET	Television Receiver		
TUBES	VHF-Sixteen, UHF-Seventeen		
POWER SUPPLY	105-120 Volts AC, 60 Cycle	RATING 160 Watts, 1.7 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

PHILCO CHASSIS 10L41, U, 10L42, U, 10L43, U

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 2 screws at bottom of picture tube holding trim. Remove spring holding trim strip around picture tube. Remove 2 screws holding metal shell strap. Remove strap and front glass.

FUSE

A fuse wire is used for filament protection. (For location, see M4 in photo "Chassis Top View".)

FUSE DEVICE

A 5.6Ω fusible resistor is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of a Range Switch. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Chassis-Top View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency control. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck, in or out of the yoke.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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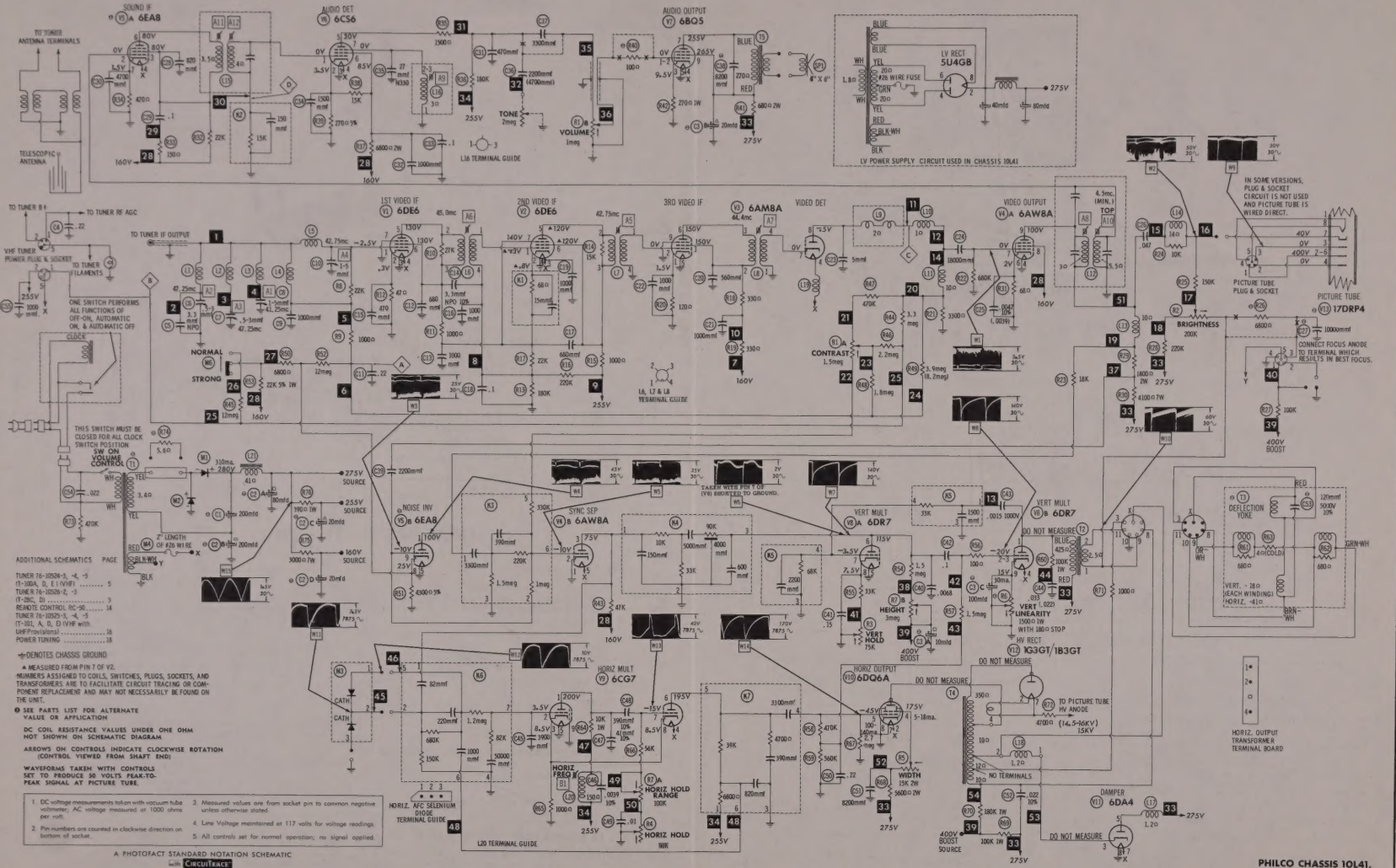
JA644

SET 466 FOLDER 1



ADDITIONAL SCHEMATICS PAGE

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TUNER 76-10528-2, -3 (T-28C, D) 5
REMOTE CONTROL RC-50 14
TUNER 76-10525-3, -4, -5 (T-10I, A, D, E) VHF with UHF Provisional 16
POWER TUNING 18

⏚ DENOTES CHASSIS GROUND

▲ MEASURED FROM PIN 7 OF V2.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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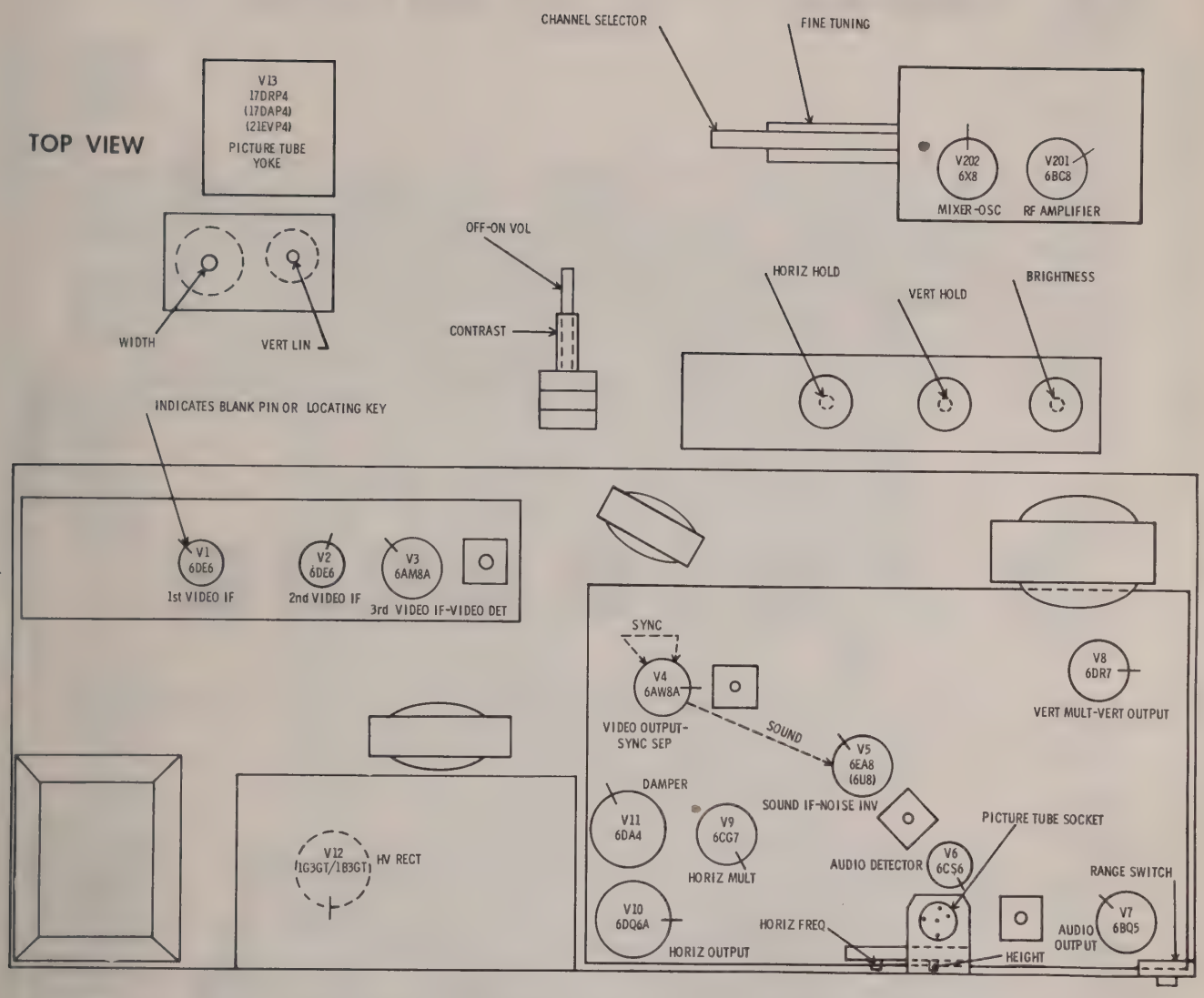
PHILCO CHASSIS 10L41, U, 10L42, U, 10L43, U

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor, Rect. (B+)

SWEEP FAILURE
No raster, has sound Diode (Horiz. AFC), V9, V10, V11, V12, V13
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, Rect. (B+)
Vert. off freq. V8
Horiz. off freq. Diode (Horiz. AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V13
Has pic, no sound V5, V6, V7

SYNC FAILURE
No vert. sync V4
No horiz. sync V4, Diode (Horiz. AFC)
No vert. or horiz. sync V4

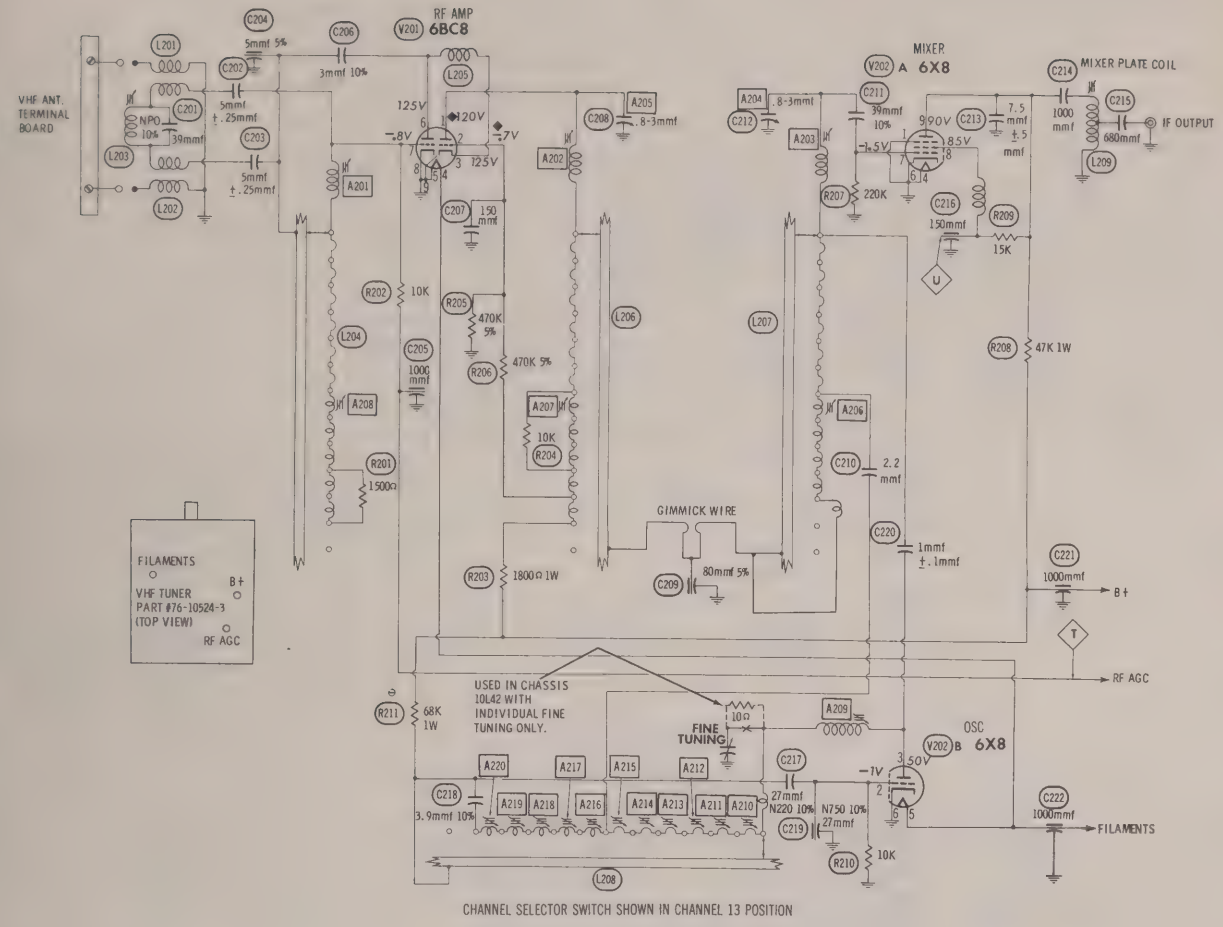
CircuiTrace Numbers 1 thru 12

VIDEO IF PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

A Howard W. Sams CircuiTrace Photo

TUNER 76-10524-3 (T-100A) - TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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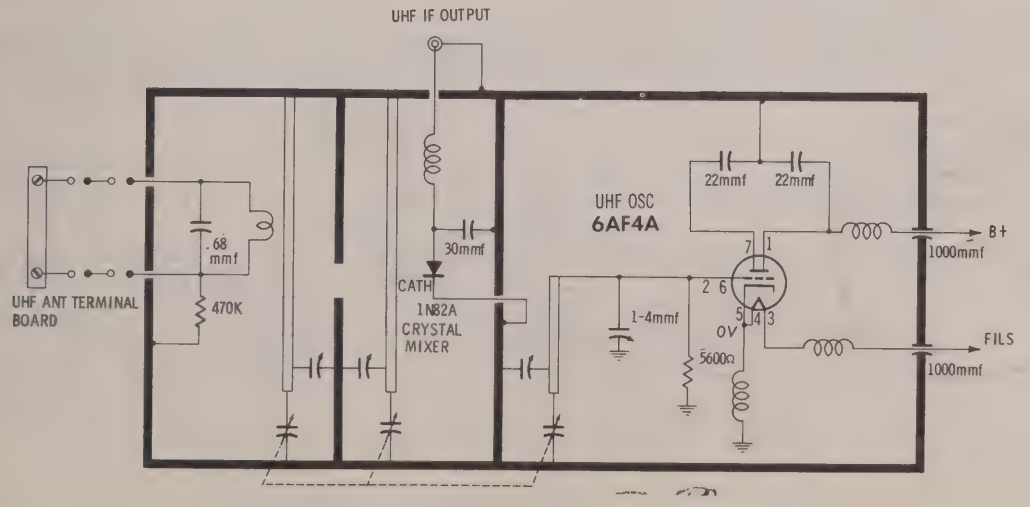
VHF TUNER 76-10524-3, -4, -5 (T-100A, D, E)



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER 76-10526-2, -3 (T-28C, D)

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNER T100, T101

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools:

A201, A202, A203, A206, A207, A208, A221	General Cement #5009, 8195, 8274, 8275, 8728, 8987 Walsco #2531
A204, A205	General Cement #5000, 5003, 5009, 8290 Walsco #2520, 2523, 2525, 2537
A209 thru A220	General Cement #8729, 8988, 8989, 9294 Walsco #2532, 2538
Mixer Plate Coil	General Cement #8606, 8606L, 8282, 9295 Walsco #2526, 2543, 2544, 2545

VHF RF AND MIXER ALIGNMENT

Set Range switch to "Normal".
Connect the negative lead of a 1.5 volt bias supply to point (T). Positive to chassis.
Detune the Mixer Plate coil by connecting a 10 to 20mmf capacitor across it.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC	210MC	13	Vert. Amp. thru 10K to point (U). Low side to chassis.	A201	Adjust for maximum amplitude.
2.	"	"	"	211.25MC	"	"	A202, A203	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. Adjust A202 to set marker level, A203 for proper tilt.
3.	"	"	177MC	174.0MC 180.0MC	7	"	A204, A205	Adjust for tilt as shown in Fig. 202. Recheck step 2 and retouch, if necessary. Repeat step 3.
4.	"	"	85MC	82.0MC 85.0MC 88.0MC	6	"	A206, A207, A208	Turn A206 counterclockwise until a single peak appears. Adjust A207 until peak falls at 85MC. Adjust A208 for maximum gain and symmetry of single peak. Retouch A206 and A207 for symmetrical response centered about 85MC.

VHF OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range.
This procedure uses the traps of the Video IF strip. Make certain Video IF Alignment is correct.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	209.75MC (400∿ 30% AM Mod)	13	Across Video Detector load	A209	Adjust for MINIMUM scope indication.
			203.75MC	12		A210	
			197.75MC	11		A211	
			191.75MC	10		A212	
			185.75MC	9		A213	
			179.75MC	8		A214	
			173.75MC	7		A215	
			81.75MC	6		A216	
			75.75MC	5		A217	
			65.75MC	4		A218	
			59.75MC	3		A219	
			53.75MC	2		A220	

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

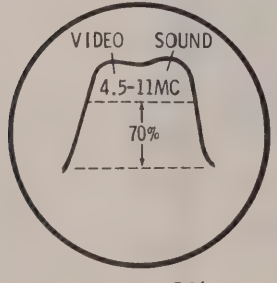
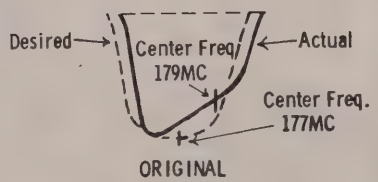


FIG.201



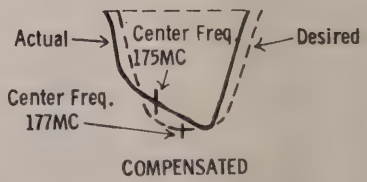


FIG.202

TUNER PARTS LIST AND DESCRIPTIONS

76-10524-3(T-100A)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V201	RF Amplifier	6BC8

ITEM No.	USE	TYPE
V202	Mixer-Osc.	6X8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	39 NPO 10%		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C202	5 ±.25mmf		NPO-SI 5	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C203	5 ±.25mmf		NPO-SI 5	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C204	5 10%	#30-1268-1						
C205	1000		EF-001	MFT-1000		CCF-102	CT280A	
C206	3 10%		NPO-SI 3	TCZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C207	150		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C208	.8-3			829-3		CV-1	CT565	
C209	80 5%	#30-1268-13						
C210	2.2		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522*	10TCC-V22
C211	39 10%		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C212	.8-3			829-3		CV-1	CT565	
C213	7.5 ±.5mmf				C10V8C		GP580	
C214	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C215	680		SI 680	DD-681	BYA10T68	CCD-681	GP368	10TS-T68
C216	150	#30-1268-6						
C217	27 N220 10%	#30-1271-3				*		10TCR-Q27
C218	3.9 10%				C10V4C			10TCC-V39
C219	27 N750 10%	#30-1268-4				CCTN-270		
C220	1 ±.1mmf		NPO-SI 1	TCZ-1			CNO-510	10TCC-V10
C221	1000		EF-001	MFT-1000		CCF-102	CT280A	
C222	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# Philco Part Number.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	1500Ω	
R202	10K	
R203	1800Ω 1W	
R204	10K	

ITEM No.	RATING	REMARKS
R205	470K 5%	
R206	470K 5%	
R207	220K	
R208	47K 1W	

ITEM No.	RATING	REMARKS
R209	15K	
R210	10K	
R211	68K 1W	Note 1

Note 1. Alternate 56K resistor is used in T-100A tuner, Ch. 10L42.

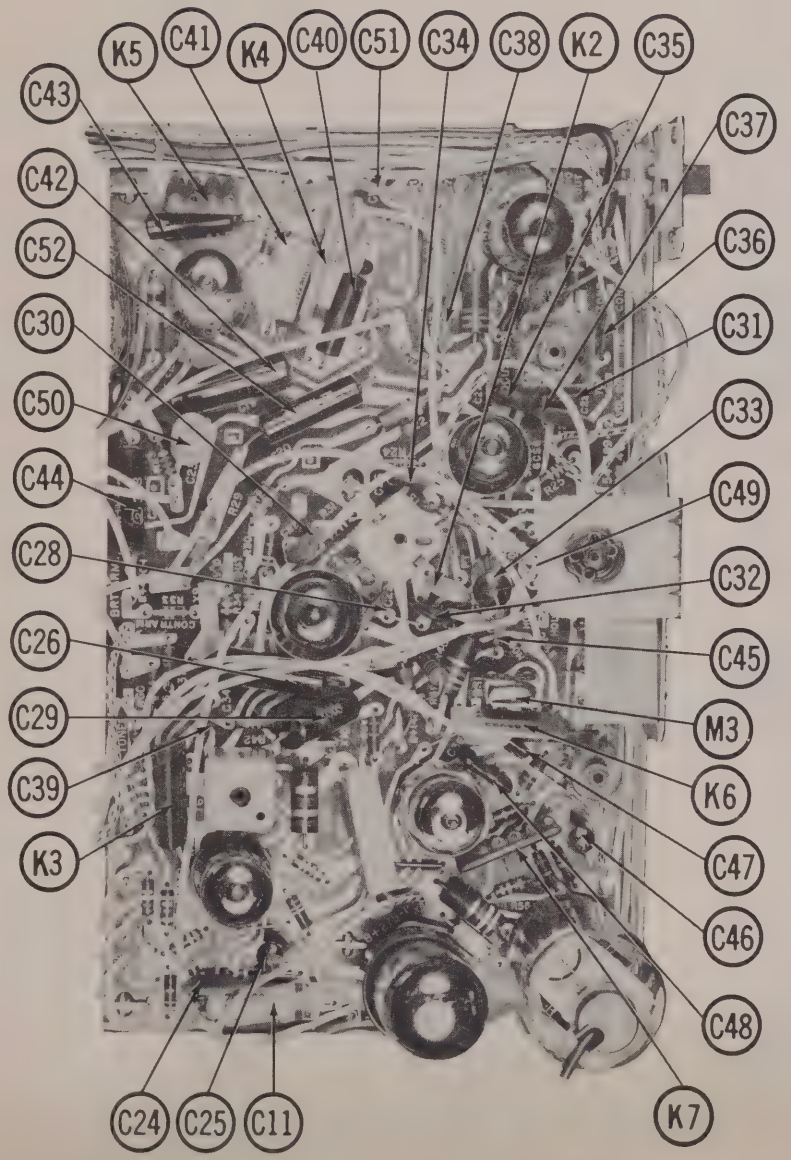
COILS (RF-IF)

ITEM No.	USE	PHILCO PART No.	NOTES
L201	Ant. Coil	32-4725-4	
L202	Ant. Coil	32-4725-4	
L203	IF Trap	32-4719-2	
L204	Ant. Coils	76-11498	Channel 2-13, Includes Wafer Assy.
L205	RF Choke	32-4652-52	
L206	RF Coils	76-11712	Channel 2-13, Includes Wafer Assy.

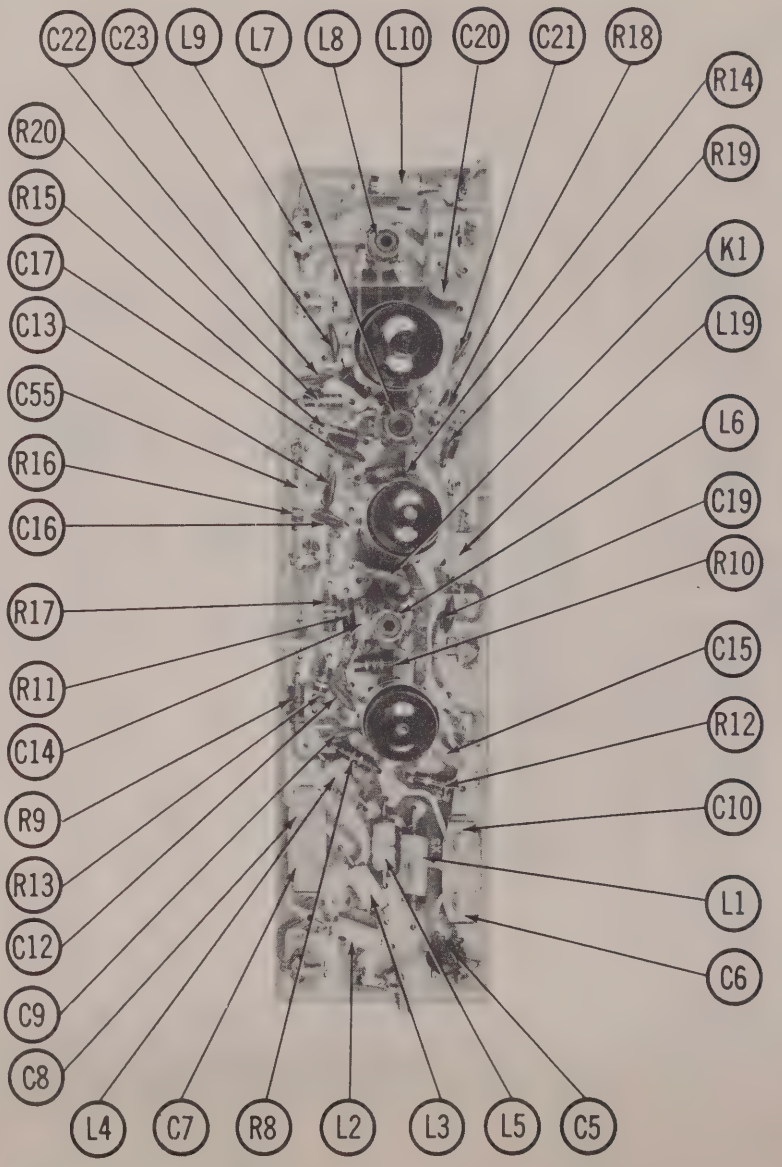
ITEM No.	USE	PHILCO PART No.	NOTES
L207	Mixer Grid Coils	76-10556	Channel 2-13, Includes Wafer Assy.
L208	Osc. Coils	76-10108	Channel 2-13, Includes Wafer Assy.
L209	Mixer Plate Coil	32-4652-48	

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
	Switch Shaft	76-11451-11	Assembly
	Wrench Extension Shaft	28-13074-1	Part of Pre-Set Fine Tuning Assembly
	Pre-Set Plate & Screw Assembly	76-11735-1	Part of Pre-Set Fine Tuning Assembly



MAIN PRINTED BOARD - CAPACITOR & MISC. IDENT.



VIDEO IF PRINTED BOARD

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: Al thru A4 .....GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
Al thru All ....GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 6 volt bias supply to point (A). Positive to chassis.
Connect the negative lead of a 3 volt bias supply to point (B). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication on VTVM.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	45.8MC (400∿ AM Mod)	Any non-interfering channel	Vert. Amp. thru 10K to point (C). Low side to chassis. (Across Video Det. load)	Mixer Plate Coil	Adjust for maximum on scope.
2.	"	"	"	41.25MC	"	"	A1	Adjust for MINIMUM on scope.
3.	"	"	"	47.25MC	"	"	A2, A3	"
4.	"	"	"	42.75MC	"	"	A4, A5	Adjust for maximum on scope.
5.	"	"	"	45.0MC	"	"	A6	"
6.	"	"	"	44.4MC	"	"	A7	"
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	"	65.75MC	4	"	Fine Tuning	Adjust for MINIMUM on scope. Leave Fine Tuning at this setting.
8.	"	"	69MC (10MC Swp)	42.75MC 45.75MC	"	"		Use only enough sweep generator output to provide a usable pattern on scope. Check for response similar to Fig. 1. If necessary retouch Mixer Plate Coil and A4 thru A7 for desired response. Position 45.75MC marker with Mixer Plate Coil and A6. Position 42.75MC marker with A4 and A5. Flatten curve with A7.

4.5MC TRAP ALIGNMENT

Use a 4.5MC tuned detector similar to Fig. 2. Before aligning trap, connect the detector to an accurate source of 4.5MC signal and adjust the coil slug for maximum DC voltage output. Set Contrast fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001mfd	High side to point (C). Low side to chassis.	4.5MC (400∿ 30% AM)	Any non-interfering channel	DC probe thru detector (Fig. 2) to pin 7 (cathode) of picture tube. Common to chassis.	A8	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV station, disconnect the antenna and adjust the Fine Tuning for best picture. DO NOT readjust Fine Tuning during balance of alignment.
Connect antenna and adjust A9 for maximum sound. Connect the DC probe of a VTVM thru 10K to point (D). Common to chassis.
Using a weak station signal (with antenna disconnected), adjust A10, A11 and A12 for maximum deflection.
If necessary, retouch SLIGHTLY A10, A11 and A12 to remove intercarrier buzz or noise interference. (DO NOT CHANGE more than 1/4".)

FIG. 1

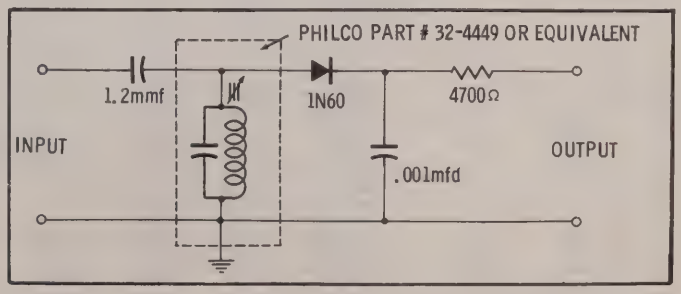


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE	TYPE
V1	1st Video IF Amp	6DE6
V2	2nd Video IF Amp	6DE6
V3	3rd Video IF Amp - Video Det	6AM6A
V4	Video Output-Sync Sep	6AW8A
V5	Sound IF Amp -Noise Inv	6EA8 (6U8) *
V6	Audio Detector	6CU6
V7	Audio Output	6BQ6
V8	Vert Mult - Vert.Output	6DR7
V9	Horiz Mult	6CG7
V10	Horiz Output	6DX8A
V11	Damper	6DA4
V12	HV Rect.	1G3GT/ 1B3GT

* Alternate

PICTURE TUBE

ITEM No	REPLACEMENT DATA — PHILCO PART No	GENERAL ELECTRIC PART No	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No	NOTES
V13	17DRP4 17DAP4 21EVP4				17DAP4/SF-17 ①	① "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA — PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SPRAGUE PART No	NOTES
C1	200	150	30-2568-78	AFH8A-24-346	XA0263.1 ⑤	FP118 ⑤	TM5-26 ⑤	TVL-1431.1*⑤	Note 1
C2A	▲80	300	30-2590-82	AFH54-47-30	700032		TMT-43	TVL2-4576 *	Note 2
B	▲200	150			BR30085	FP333.5 ⑤	TD-200-150		
C	▲20	300							
D	20	300							
C3A	▲10	450	30-2590-49	AFH3-157	C1350	FP399	TMD-49	TVL-3928	Note 3
B	▲20	350					TD-100-50		
C	100	50							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer. ▲ Use insulating tube.
Note 1. Not used in Ch. 10L41, U. Note 3. Alternate Part #30-2590-56.
Note 2. Ch. 10L41, U use 60/20/20/40mfd ② 350V (Part #30-2590-48).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING	REMARKS	REPLACEMENT DATA — AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	22 100V		P288N-22	CUB2F22	1DP-3-224	GEM-2022	2TM-P22	
C5	3 3 NPO		BPD-00068	DTZ-3R3	C10V33C	CCTO-3R3	CNO-522	10TCC-V33
C6	5-3			829-3		CV-1	CT565	
C7	5-3			829-3		CV-1	CT565	
C8	1-5	#31-6535-2		829-6				
C9	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-110	5HK-D10
C10	1-5	#31-6535-2		829-6				
C11	22 100V		P288N-22	CUB2F22	1DP-3-224	GEM-2022	2TM-P22	
C12	680		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	5GA-T68
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-110	5HK-D10
C14	3 3 NPO 10%		NPO-3I 3 3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-522	10TCC-V33
C15	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-110	5HK-D10
C17	680		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	5GA-T68
C18	1 200V		P288N-1	DF-104	CUB1P1	2DP-3-104	GEM-201	2TM-P1
C19	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-110	5HK-D10
C20	560		DI-560	DD-561	L10T56	CCD-561	B-356	5GA-T56
C21	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-110	5HK-D10
C22	1000		BPD-001	DD-102	BYA10D1	CCD-103	B-110	5HK-D10
C23	5		DI-5	DD-050	L10Y5	CCD-050	GP550	10TG-Y50
C24	18000		BPD-02	DD-303	BYB052	CCD-303	B-130	5HE-B30
C25	.0047 400V 10%	(.0039mfd)*	V84C8D47-10%		PM8D47	6DP-1-472	JL-347	6TM-D47
C26	.047 400V		P488N-047	DD-533	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C27	10000	③	BPD-01	DD-103	BYA10S	CCD-103	B-110	5HE-B10
C28	8300		DAC-28	DD-832	HVE16D8	CCD-832	B-332	6TM-D8
C29	1 200V		P288N-1	DF-104	CUB2F1	2DP-3-104	GEM-201	2TM-P1
C30	4700		BPD-0047	DD-472	BYA10D47M	CCD-473	B-347	5HK-D47
C31	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C32	1000		BPD-001	DD-102	BYA10D1	CCD-103	B-110	5HK-D10
C33	1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C34	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-115	5HK-D15
C35	27 N330	#30-1263-46						
C36	2200	(4700mmf)*	BPD-0022	DD-222	BYA10D22	CCD-222	B-322	5HK-D22
C37	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-332	5HK-D33
C38	8300	③	DAC-28	DD-832	HVE16D8	CCD-832	B-332	6TM-D8
C39	2200		BPD-0022	DD-222	BYA10D22	CCD-223	B-322	5HK-D22
C40	.0068 400V		P488N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C41	15 100V		P288N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15
C42	1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C43	.0015 1000V		P1088N-0015	DD-152	CUB1D15	1SDP-1-152	GEM-10215	10TM-D15
C44	.033 400V	(.032mfd)*	P488N-033	DD-333	CUB4S33	4DP-3-333	GEM-4133	4TM-S33
C45	3900		BPD-004	DD-392	BYA10D4	CCD-393	GP339	5HK-D40
C46	.0039 600V 10%		V84C6D4-10%		PM6D4	6DP-1-392	GEM-1624	6TM-D4
C47	47 10%		1469-000047	TCZ-47	22R5Q47	CM-20B-470K	MCB235	M5-447
C48	390 10%		1469-00039	D6-391	22R5T39	CM-20B-391K	MCB243	M5-339
C49	91 400V		P488N-01	DD-103	CUB4S	4DP-1-103	GEM-411	4TM-S
C50	22 100V		P288N-22		CUB2F22	2DP-3-224	GEM-201	2TM-P22
C51	8200		DAC-26	DD-822	HVE16D6	CCD-822	B-382	6TM-D8
C52	.022 400V 10%		V84C4S22-10%	DD-203	PM4S22	4DP-3-223	GEM-1612	4TM-S22
C53	120 5000V 10%	#30-1246-26 ⑤						
C54	.022 600V		P488N-022	DD-203	CUB6S22	6DP-3-223	GEM-6122	6TM-S22
C55	1000		BPD-001	DD-102	BYA10D1	CCD-103	B-110	5HK-D10

\# Philco Part Number * Alternate values.
** Not normally in distributor's stock. Available thru distributor on order to manufacturer.
‡ Not used in some versions. ③ Ch. 10L41, U, 10L42, U use 135mmf 9% ⑤ 5000V in this
⑤ Runs 1 thru 3 use 6800mmf in this application. application (Part #30-1246-17).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA — PHILCO PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No.	MALLORY PART No	INSTALLATION NOTES
R1A	1 Smeg	½	33-5569-48				● UE4069-8	Contrast
B	1meg	½						Volume
C	Switch							Push-Push Off-On
R2A	300K	½	33-5569-34	B-46	A47-300K-S	QH-139	U43	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	75K	½	33-5569-25	B-35	A47-75K-S	QH-138	RU75L	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	SS-1500	
C	Bushing			Not Req.	Not Req.	Not Req.	SL38	
R4A	50K	½	33-5569-30	B-31	A47-50K-S	QH-133	TA54L	Horiz. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	15K	2(WW)	33-5574-7	WW-153	A58-15K	WFN15000	R15ML	Width
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R6	1800Ω 180Ω Stop	1(WW)	33-5561-20		39-1500 *	113-1500 *	FL-15K *	Vert. Lin., Note 1
R7A	100K	½	33-5595-3					Horiz. Freq.
B	Smeg							Height

* Use 180Ω resistor in series with terminal. # "STA-LOC" Equivalent: FA181L, RUP181, DSR125
Note 1. Some versions may use 1500Ω with 300Ω stop (Part #33-5591-17).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R8	22K	
R9	1000Ω	
R10	37K	
R11	1000Ω	
R12	47Ω	
R13	180K	
R14	15K	
R15	1000Ω	
R16	220K	
R17	22K	
R18	330Ω	
R19	330Ω	
R20	120Ω	
R21	3300Ω	
R22	680K	
R23	18K	
R24	10K	
R25	150K	
R26	6800Ω	
R27	100K	
R28	220K	
R29	1800Ω 2W	
R30	4100Ω 7W	#33-1335-149

ITEM No.	RATING	REMARKS
R31	68Ω	
R32	22K	
R33	150Ω	
R34	470Ω	
R35	1500Ω	
R36	180K	
R37	6800Ω 2W	
R38	47K	
R39	270Ω 5%	
R40	100Ω	①
R41	6800 2W	
R42	270Ω 1W	
R43	47K	
R44	3.3meg	
R45	12meg	
R46	2.2meg	
R47	470K	
R48	1 8meg	
R49	3 9meg	(8.2meg)*
R50	6800Ω	
R51	4300Ω 5%	#66-24382-40
R52	12meg	
R53	22K 5% 1W	

ITEM No.	RATING	REMARKS
R54	1.5meg	
R55	33K	
R56	100Ω	
R57	1.5meg	
R58	470K	
R59	560K	
R60	100K 1W	
R61	680Ω	
R62	680Ω	
R63	4Ω Cold	#33-1343-19
R64	10K 1W	
R65	1000Ω	
R66	56K	
R67	2.7meg	
R68	5600Ω 2W	#66-2565340 ②
R69	100K 1W	
R70	180K 1W	
R71	1000Ω	
R72	4700Ω	
R73	470K	
R74	5.6Ω	#33-1366-3 ①
R75	3000Ω 7W	#33-1363-38
R76	3900Ω 1W	

* Alternate value. # Philco Part Number.
Note 1. Not used in some versions.
Note 2. Run 4 and later use 5600Ω 3W in this application.
Note 3. Not used in Ch. 10L41, U.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA — PHILCO PART No.	Gramer PART No.	Meissner PART No	Merit PART No	Miller PART No	Ram PART No	NOTES
L1	47.25MC Trap Coil	32-4645-33	19-1001	19-1001	BC-562	4604		*
L2	47.25MC Trap Coil	32-4645-19						
L3	41.25MC Trap Coil	32-4645-34						
L4	RF Choke	32-4645-41						
L5	1st Video IF Coil	32-4645-36	19-3001	19-3001	TV-189	6175	VP-9	
L6	2nd Video IF	32-4686-22						Includes C14
L7	3rd Video IF	32-4686-2						
L8	4th Video IF	32-4686-3						
L9	Resonant Choke	32-4674-1						22uh
L10	Resonant Choke	32-4645-7						3uh
L11	Shunt Peaking Coil	32-4763-8	19-4201	19-4201	TV-197	6154		220uh
L12A	Sound Take-Off	32-4688-9						
B	4.5MC Trap							
L13	Shunt Peaking Coil	32-4763-8	19-4201	19-4201	TV-197	6154		220uh
L14	Series Peaking Coil	32-4762-10	19-3330	19-3330	TV-200	6132	VP-7	330uh
L15	2nd Sound IF	32-4745-2						
L16	Quadrature Coil	32-4644-20						
L17	RF Choke	32-4115-62	19-1005	19-1005	BC-566	4612		9uh
L18	RF Choke	32-4115-63	19-1005	19-1005	BC-566	4612		9uh
L19	Fil. Choke	32-4645-40						

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA — PHILCO PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L20	150Ω		32-4754-3						Horiz. Stabilizer

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (@ CURRENT 1000 ^)	REPLACEMENT DATA — PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L21	.310A	41Ω	1.3 Hy.	32-8710-8	28C44				28C44	C-28X

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA — PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No.	Triad PART No.
T1	117V ② 1.7A	120V ② 1.17A (AC)	6.3V ② 8A tap ⑤ 2.7V ⑤ .5A	32-8903-1 ①						

① Ch. 10L41, U use Part #32-8897-1.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA — PHILCO PART No	Halldorson PART No	Merit PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Output	32-8829-5	28575 ①					28575 ①	A-108X
T3	Yoke-Horiz (34MH) (110°)-Vert (37MH)	76-10508-14							
	Alt Yoke	76-10508-13 ②							
	Alt Yoke	76-10508-16 ③							
	Rear Cover, Clamp, & Centering Assy.	76-11644-1 ④							
	Rear Cover, Clamp, & Centering Assy.	76-10513-2 ⑤							
T4	Horiz. Output	32-8899-1							

① Use 8 to 1 turns ratio. ④ Used in Ch. employing 17DRP4 or 21EVP4 picture tube.
② Used in Ch. 10L41, U. ⑤ Used in Ch. employing 17DAP4 picture tube.
③ Used in Ch. 10L42, U.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA — PHILCO PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T5	4300Ω	3-4Ω	32-8862-2	24851	A-2930	AU-601	A-3877	[redacted]	S-3X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA — PHILCO PART No.	QUAM PART No.	NOTES
SP1	4" x 6"	PM	3-4Ω	30-1676-8	46A1	

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	PHILCO PART No	REPLACEMENT DATA
K1	2nd Video IF Cathode	15mmf, 68Ω	30-8039-1	Sprague PRC-12
K2	Audio Detector Grid	150mmf, 15K	30-8031-1	Sprague PRC-7
K3	Sync Sep. Grid	390mmf, 3300mmf, 220K, 330K, 1meg, 1.5meg	30-8833-3	
K4	Vert. Integrator	150mmf, 600mmf, 4000mmf, 5000mmf, 10K, 33K, 90K	30-8030-7	Sprague V-23
K5	Vert. Feedback	1800mmf, 2200mmf, 33K, 68K	30-8509-1	
K6	Horiz. AFC Network	82mmf, 220mmf, 1000mmf, 50000mmf, 82K, 150K, 680K, 1.2meg	30-8035-3	Sprague C-11
K7	Horiz. Multi	390mmf, 820mmf, 3300mmf, 47000, 68000, 39K	30-8531-2	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA — PHILCO PART No.	FEDERAL PART No	INTERNATIONAL PART No	SARKES TARZIAN PART No.	SYLVANIA PART No	NOTES
M1	.310A	34-8048-1 ① ②	HF-504 ③	SD-500 ①	40K ③	SR500 ②	① Ch.10L41 use 5U4GB
M2	.310A	34-8048-1 ① ④	HF-504 ③	SD-500 ①	40K ③	SR500 ②	② Silicon type.
M3		34-8037 ③	K2815 ③	SD-91 ② ④			③ Dual Selenium Diode
							④ Two Required

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA — PHILCO PART No. FUSE	PHILCO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No FUSE	BUSS PART No HOLDER
M4	2" Length #26 Wire							

MISCELLANEOUS

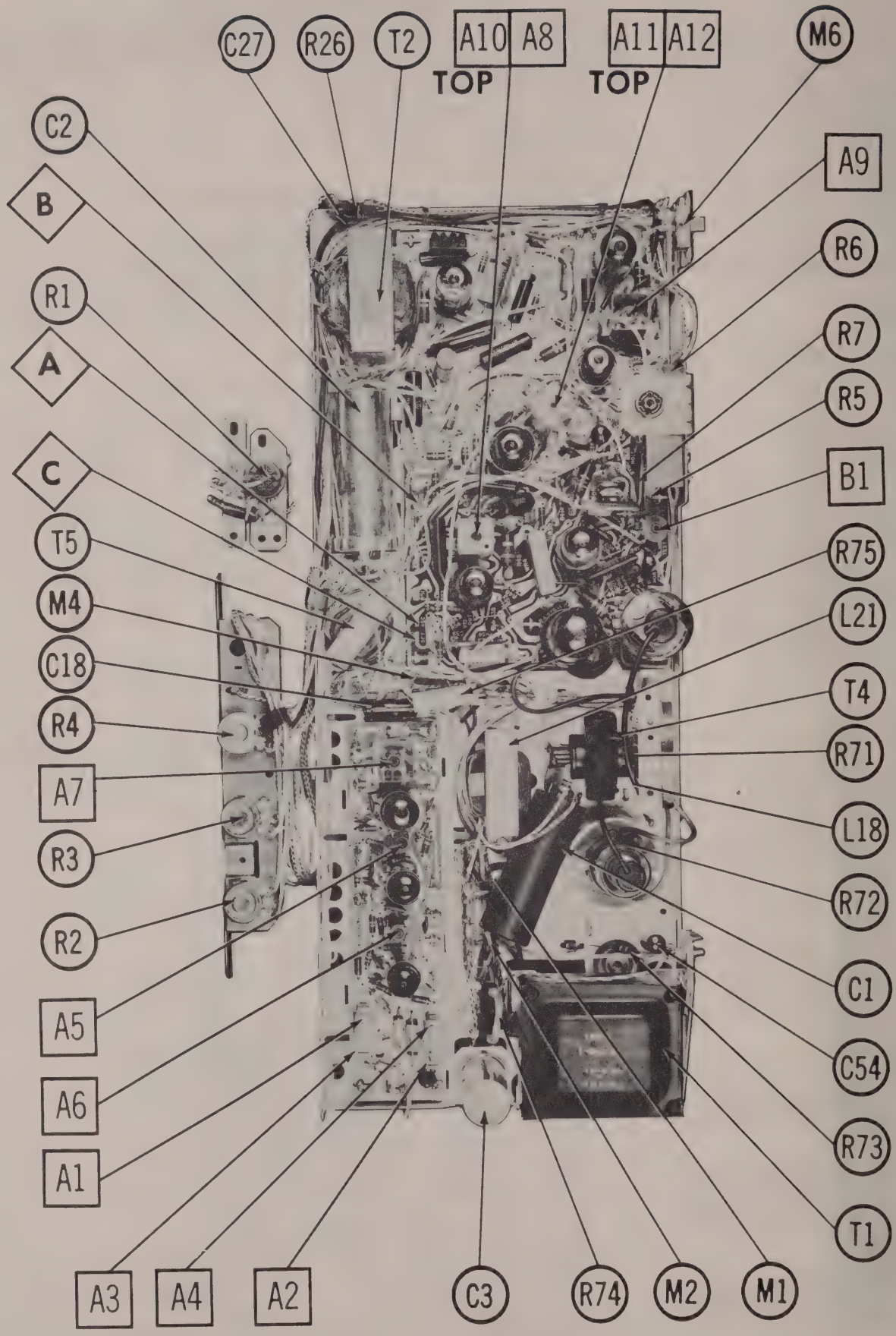
ITEM No.	PART NAME	PHILCO PART No.	NOTES
M5	Tuner	76-10534-3	VHF (T-10GD) Ch. 10L43
	Tuner	76-10525-4	VHF (T-10GE) Ch. 10L41
	Tuner	76-10524-3	VHF (T-10GA) Ch. 10L42
	Tuner	76-10533-3	VHF with UHF provisions (T-10LD) Ch. 10L43U
	Tuner	76-10534-4	VHF with UHF provisions (T-10LE) Ch. 10L41U
	Tuner	76-10525-5	VHF with UHF provisions (T-10LA) Ch. 10L42U
	Tuner	76-10526-3	UHF (T-28D) Ch. 10L43U
	Tuner	76-10526-2	UHF (T-28C) Ch. 10L43U
M6	Switch	42-2076-1	Range (SPDT Slide Type)
	Switch	42-2117-1	Manual-Remote, Ch. 10L42
	Switch	76-11140-1	Touch Tuning, Pushbutton, Ch. 10L42
	Switch	42-2108	Stepper, Remote Tuning
	Magnet	76-10970	Beam Alignment, Used on some picture tubes
	Printed Board	54-8993	Video IF
	Printed Board	54-8994	Main, Run 1
	Printed Board	54-8994-2	Main, Run 2 (Red Dot)

WIRING DATA

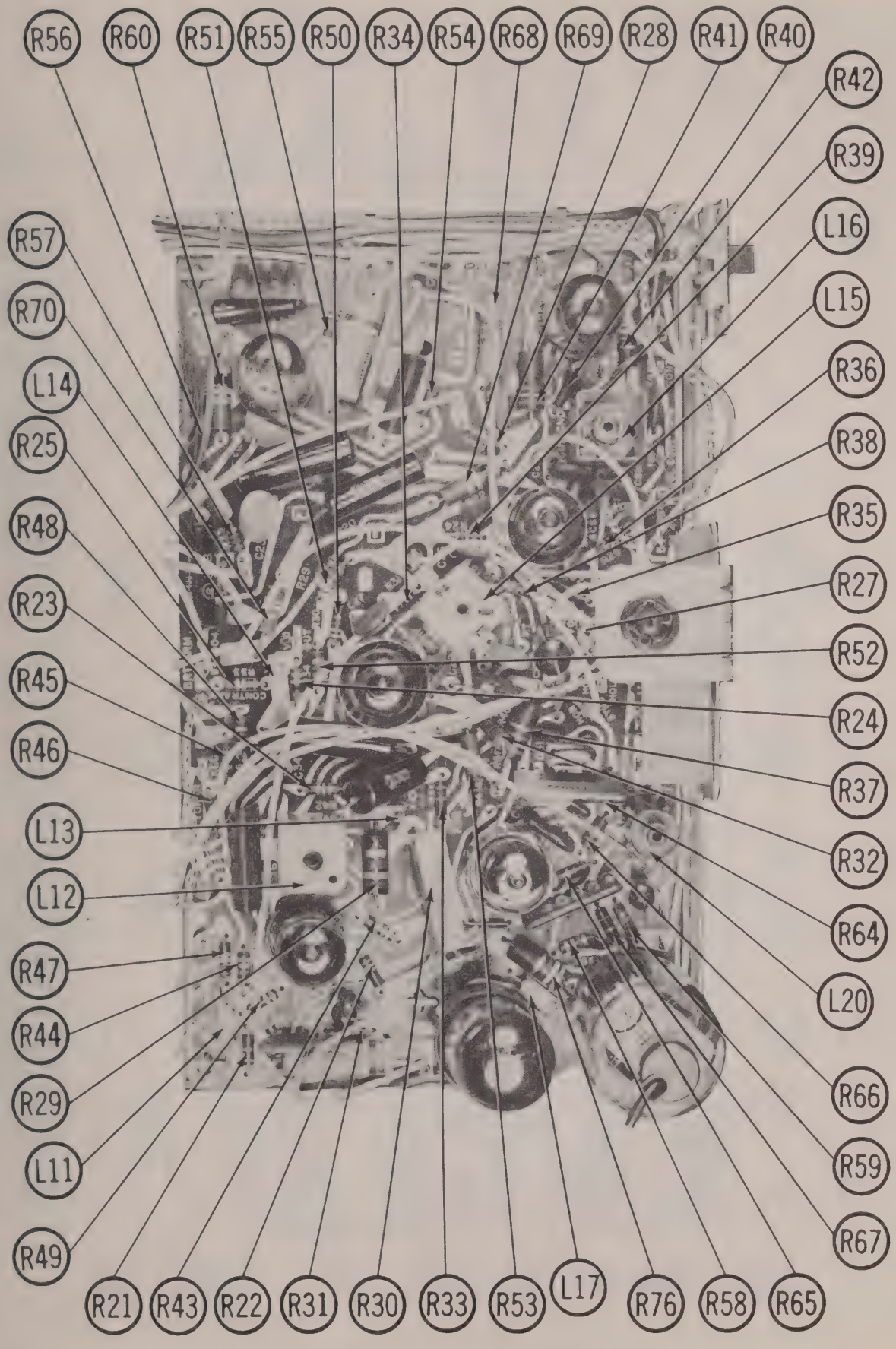
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

PHILCO CHASSIS 10L41, U, 10L42, U, 10L43, U

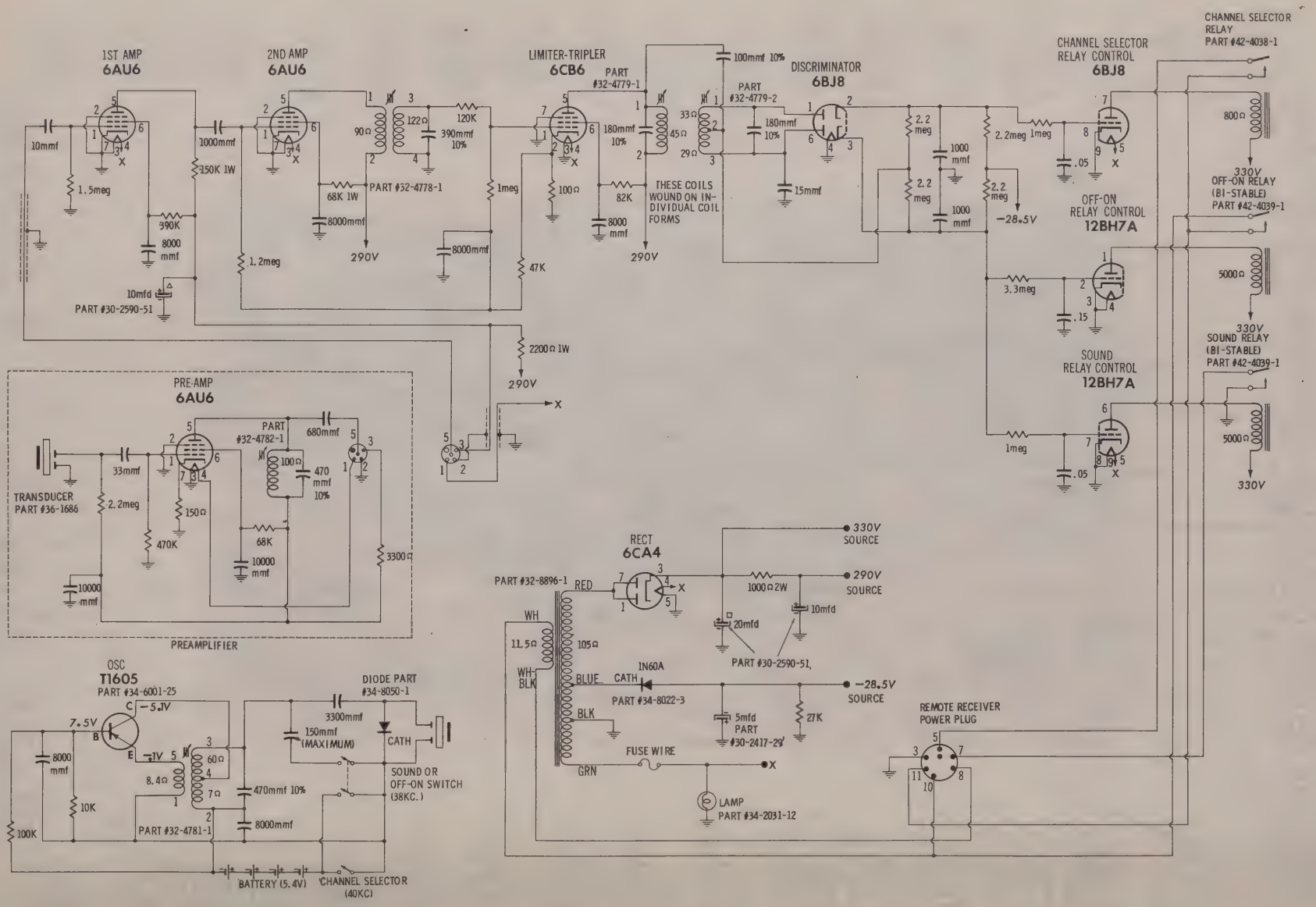
FOLDER 1



CHASSIS TOP VIEW



MAIN PRINTED BOARD - RESISTOR & INDUCTOR IDENTIFICATION



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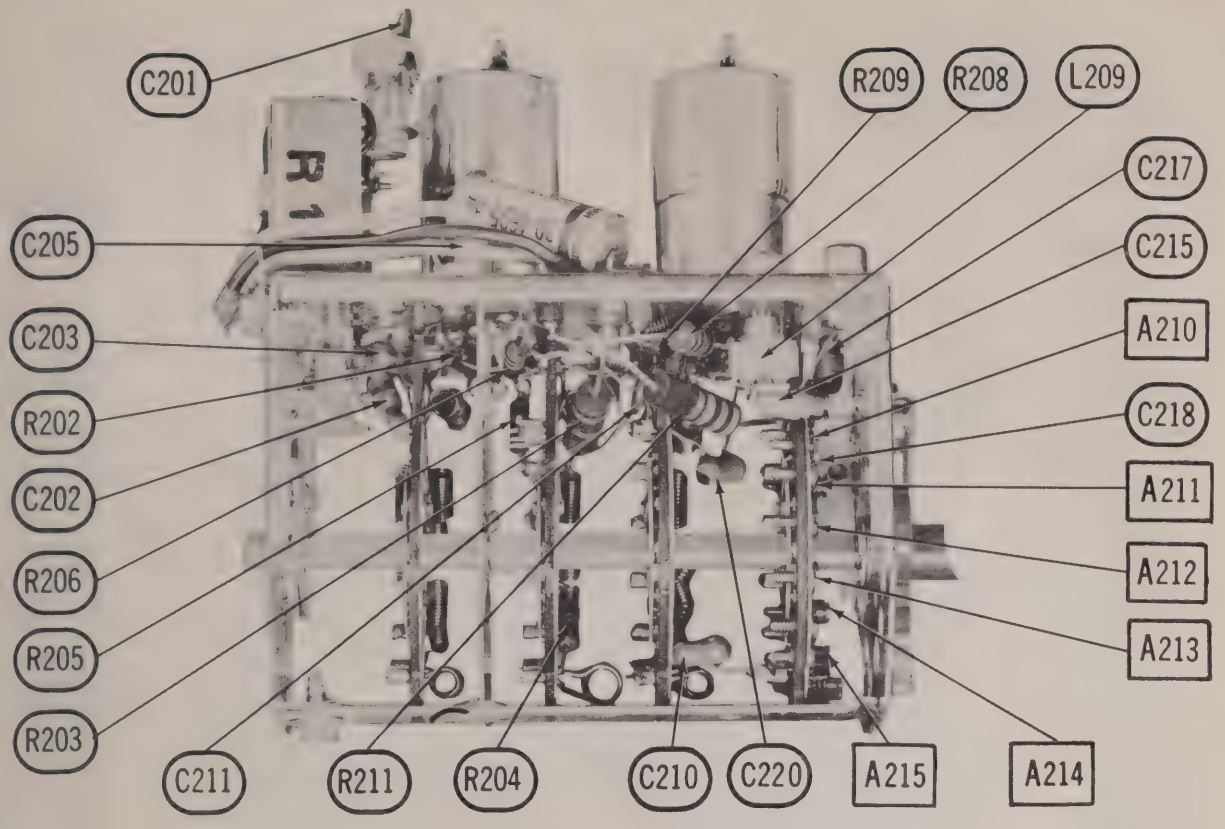
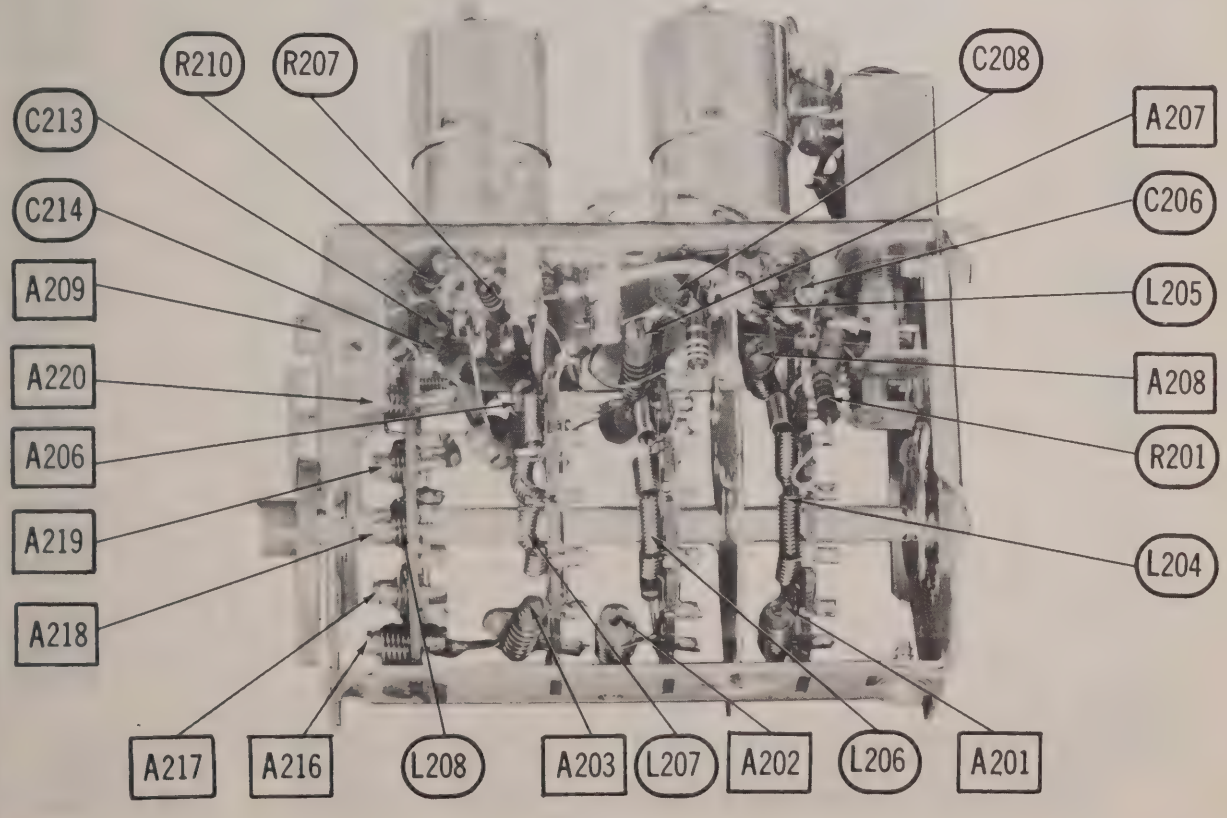
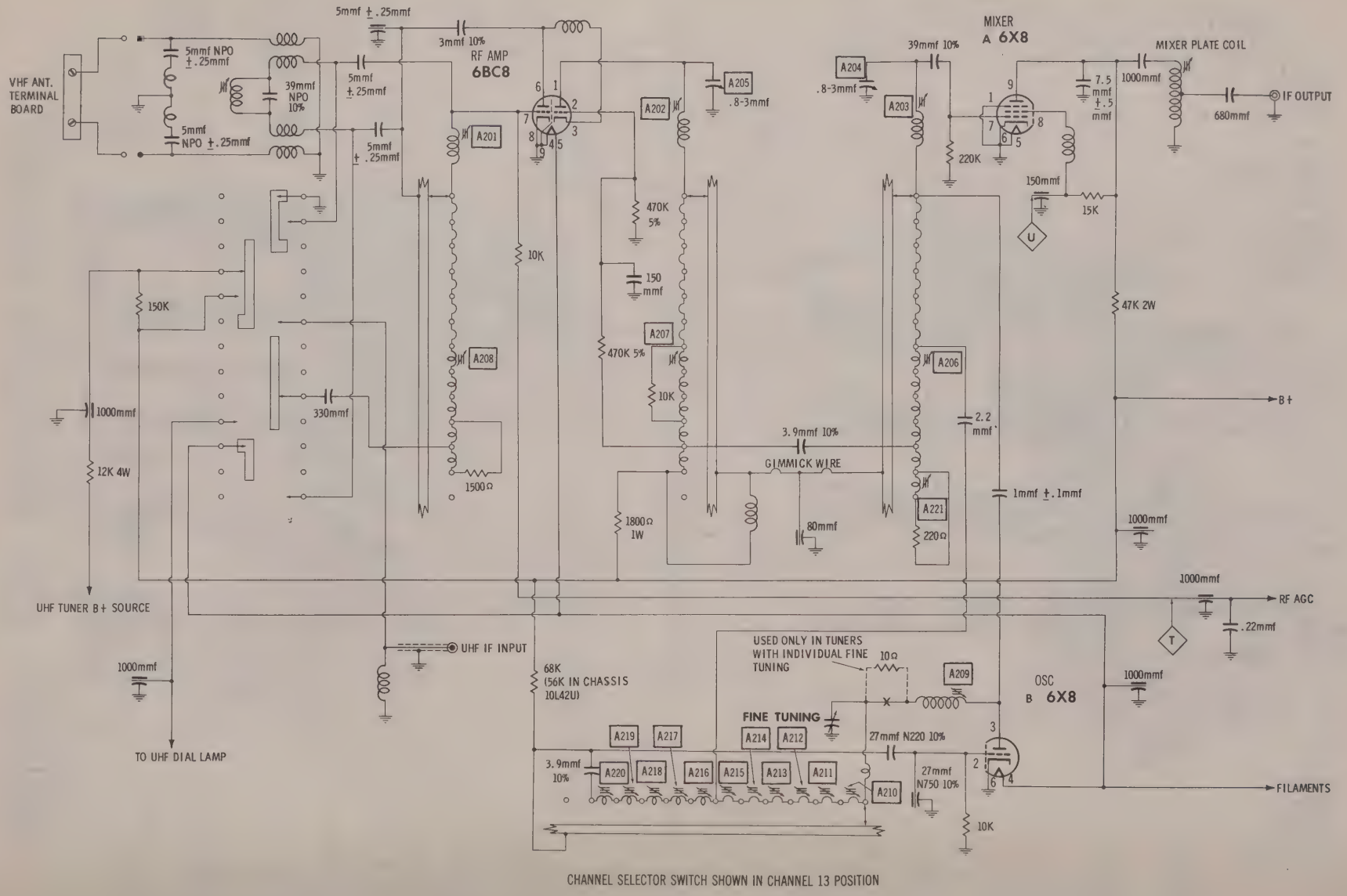
REMOTE CONTROL RC-50



TUNER 76-10524-3 - LEFT SIDE



TUNER 76-10524-3 - RIGHT SIDE



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

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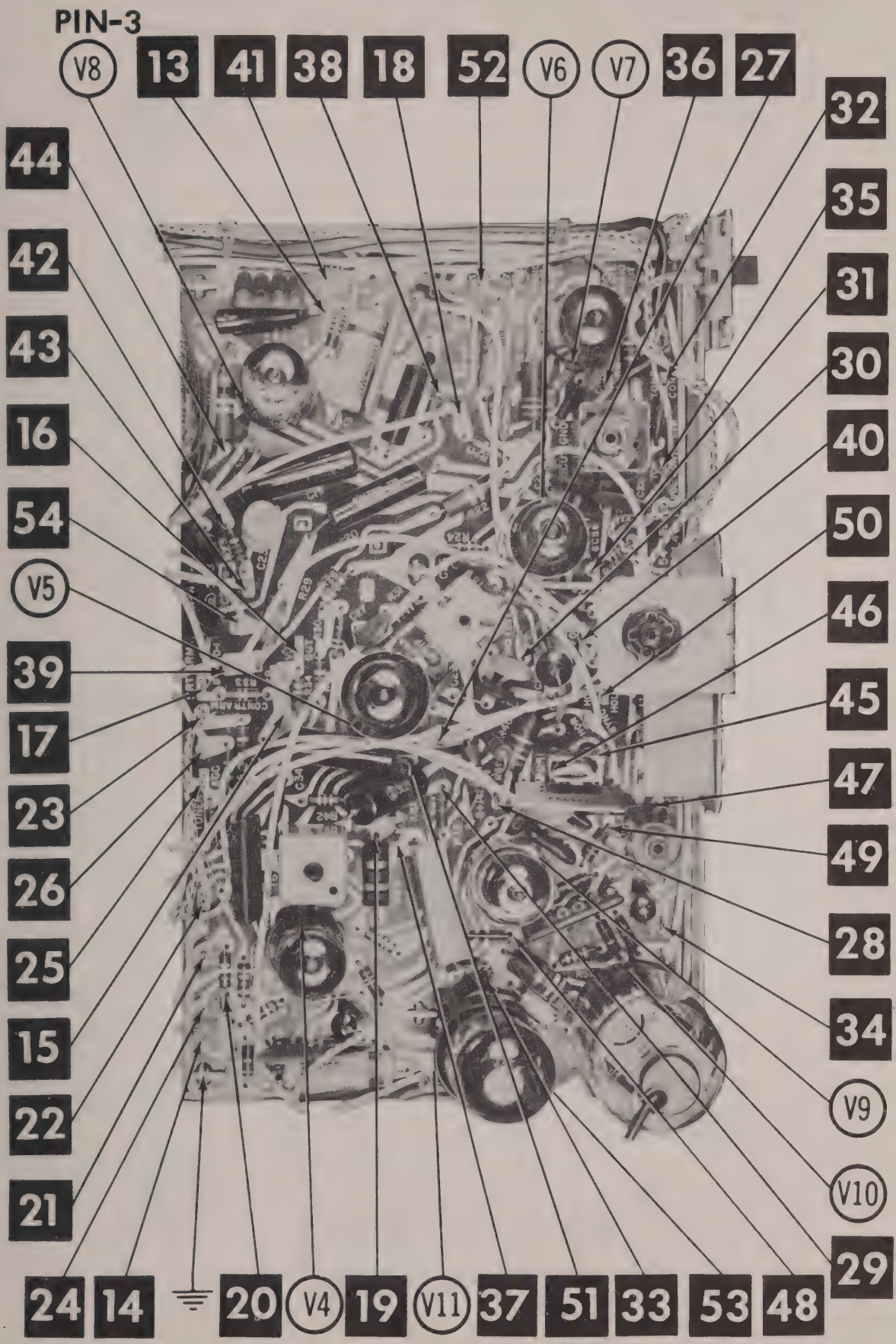
VHF TUNER with UHF Provisions 76-10525-3, -4, -5 (T-101A, D, E)

CircuiTrace Numbers 13 thru 54



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MAIN PRINTED BOARD

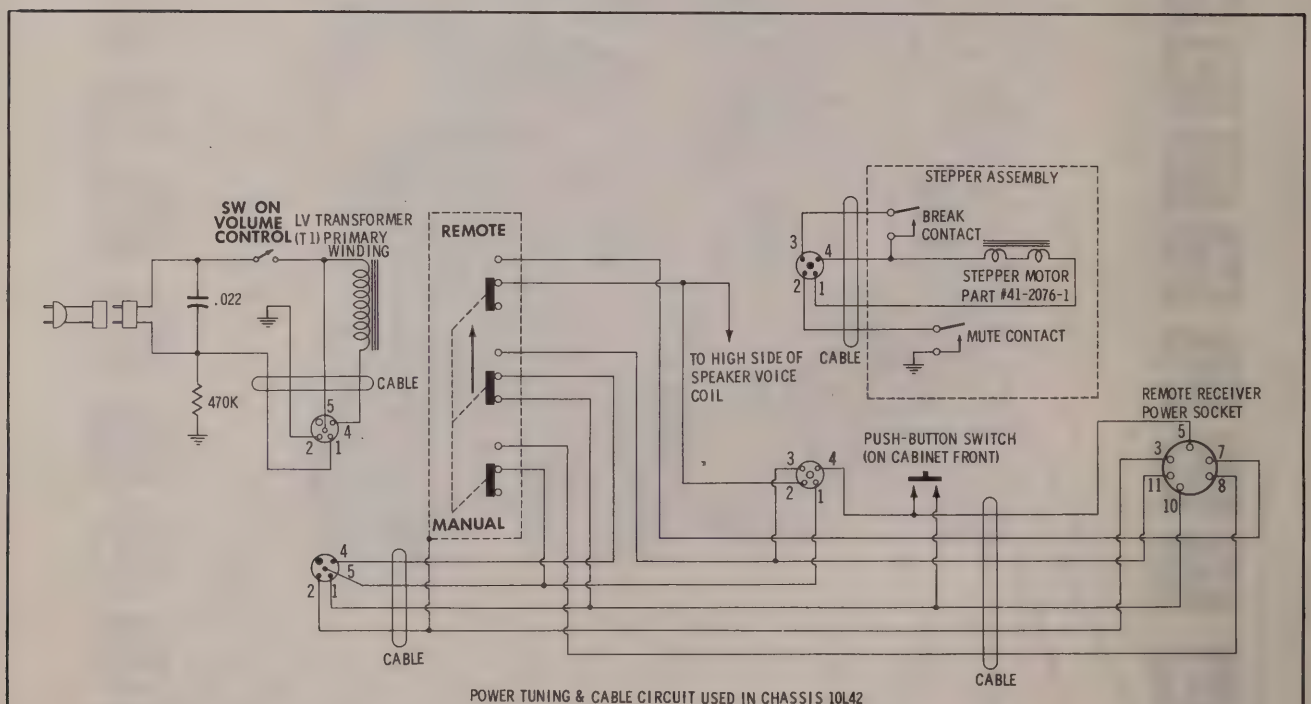
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DE6	1.5meg	47Ω	0Ω	.1Ω	▲1000Ω	▲1000Ω	0Ω		
V2	6DE6	180K	▲68Ω	.1Ω	0Ω	†1400Ω	†1400Ω	200K		
V3	6AM8A	120Ω	.2Ω	†3600Ω	.1Ω	0Ω	†3600Ω	.2Ω	3300Ω	0Ω
V4	6AW8A	0Ω	1.1meg	†30K	0Ω	.1Ω	68Ω	680K	†3000Ω	†5900Ω
V5	6EA8	†24K	5.5Ω	†25K	.1Ω	0Ω	†25K	470Ω	4300Ω	2.1meg
V6	6CS6	15K	270Ω	0Ω	.1Ω	†180K	†10K	3Ω		
V7	6BQ5	100Ω	100Ω	270Ω	.1Ω	0Ω	NC	†950Ω	NC	†680Ω
V8	6DR7	†425Ω	2.1meg	2.1meg	.1Ω	0Ω	● †3.5meg	68K	●50K	●450Ω
V9	6CG7	†10K	1.9meg	1000Ω	.1Ω	0Ω	†45K	●100K	1000Ω	0Ω
V10	6DQ6A	NC	.1Ω	TP	†11K	700K	TP	0Ω	0Ω	TOP CAP †13Ω
V11	6DA4	NC	NC	¶350K	NC	†1.2Ω	NC	.1Ω	0Ω	
V12	1G3GT 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †360Ω
V13	17DRP4	0Ω	NC	450K	0Ω	NC	†280K	200K	.1Ω	
V201	6BC8	†1800Ω	270K	INF	.1Ω	0Ω	INF	1.4meg	0Ω	0Ω
V202	6X8	0Ω	10K	†68K	0Ω	.1Ω	0Ω	220K	†62K	†47K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM 275V SOURCE.
ϕ MEASURED FROM PIN 3 OF V11.

NC NO CONNECTION.
TP TIE POINT.



POWER TUNING & CABLE CIRCUIT USED IN CHASSIS 10L42

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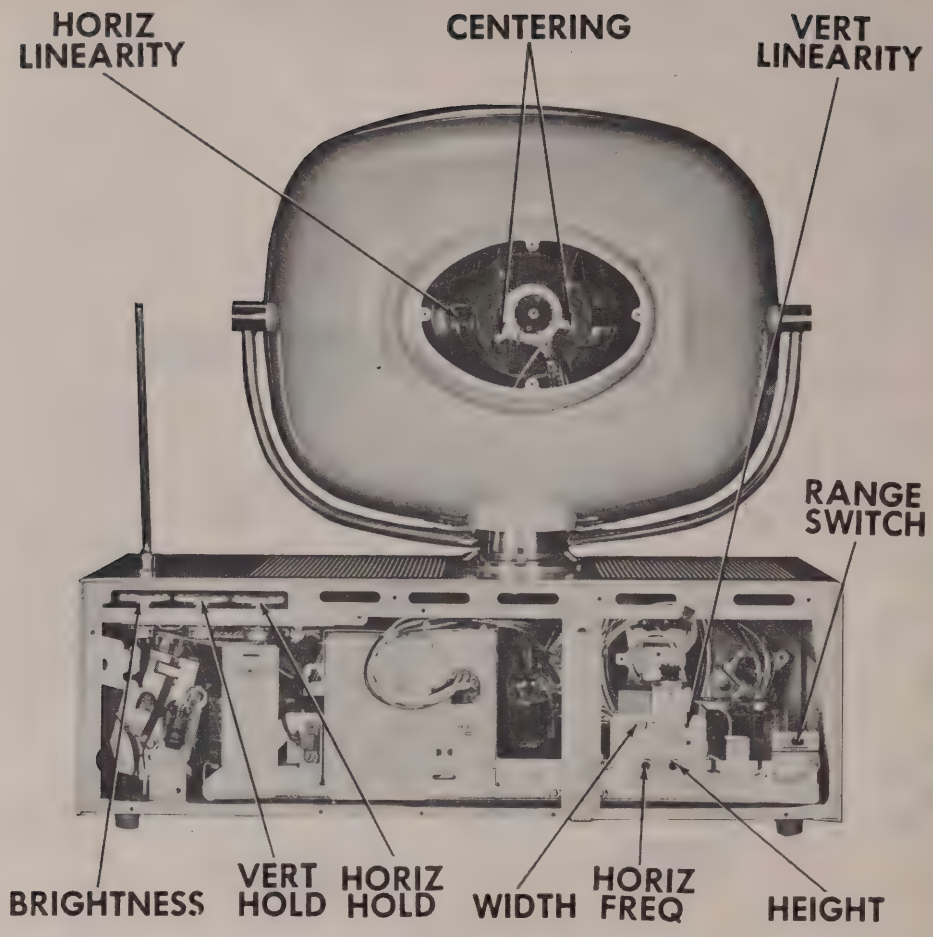
ALTERNATE POWER TUNING



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a station signal. Allow the receiver to warm up. Connect a clip lead across the Horizontal Stabilizing coil (L20).

Set the Horizontal Frequency control (R7) until the picture appears to float back and forth across the screen.

Remove the clip lead from across L20 and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL H3412L

1. Remove 4 push-on type knobs from front of cabinet.
2. Remove 8 metal screws holding rear cover. Remove the rear cover.
3. Remove tuner connections, yoke plug, speaker leads, AC interlock from clock, picture tube socket connecting plug, video lead, and HV lead. (CAUTION: HV lead must be unplugged from 1G3 socket by opening 1G3 access door.)
4. Remove 2 metal screws holding rear control mounting bracket.
5. Remove 2 metal screws holding rear cabinet brace.
6. Remove 2 nuts holding front control bracket.
7. Remove 2 metal screws holding rear cover interlock.
8. Remove 4 chassis bolts from bottom of cabinet.
9. Remove chassis.
10. Remove 3 metal screws on bottom of cabinet holding the tuner. Remove tuner.

PICTURE TUBE HOUSING DISASSEMBLY

1. Remove 2 metal screws holding trim at bottom of picture tube.
2. Remove spring holding trim strip around picture tube.
3. Remove 2 screws holding metal shell strap. Remove strap and front glass.
4. Remove 2 brass plugs, one on either side of shell. Remove 2 metal screws now exposed.
5. Remove 2 screws at bottom of picture tube holding rear shell. Remove rear shell.
6. Remove yoke and picture tube socket.
7. Loosen picture tube mounting strap bolts.
8. Remove picture tube.

PHOTOFACT* Folder with CIRCUITRACE*

EIA

ZENITH MODELS D1810B, BU, D1811C, CU, D1812L, LU, D1814P, PU, D2010C, D2015L (Ch. 16D25, Q, U)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ZENITH MODELS D1810B, BU, D1811C, CU, D1812L, LU, D1814P, PU, D2010C, D2015L (Ch. 16D25, Q, U)

MODEL D2015L (Ch. 16D25Q)

ZENITH MODELS D1810B, BU, D1811C, CU, D1812L, LU, D1814P, PU, D2010C, D2015L (Ch. 16D25, Q, U)

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EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ZENITH MODELS D1810B, BU, D1811C, CU, D1812L, LU, D1814P, PU, D2010C, D2015L (Ch. 16D25, Q, U)

ZENITH MODELS D1810B, BU, D1811C, CU, D1812L, LU, D1814P, PU, D2010C, D2015L (Ch. 16D25, Q, U)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL D2015L

1. Remove 6 push-on type knobs from front and side of the cabinet.
2. Remove 6 phillips head type metal screws holding rear cover. Remove rear cover.
3. Remove mike lead, AC power socket, motor plug, pilot lamp, and audio leads from Remote Control chassis.
4. Remove 3 metal screws holding Remote Control chassis.
5. Remove Remote Control chassis.
6. Remove signal, AGC, B+, tuner filament, pilot lamp, and inside antenna leads from tuner.
7. Remove 2 screws holding tuner mounting bracket at rear of cabinet. Remove tuner.
8. Remove 2 metal screws holding Off-On Volume control.
9. Remove speaker leads.
10. Remove 2 metal screws holding picture tube mounting bracket at top of cabinet.
11. Remove 4 chassis bolts from bottom of cabinet.
12. Remove chassis.

MODEL D2015L (Ch. 16D25Q)

TRADE NAME	Zenith	MODELS	CHASSIS
		D1810B, D1811C, D1812L, D1814P	16D25
		D1810BU, D1811CU, D1812LU, D1814PU	16D25U
		D2010C, D2015L	16D25Q
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Avenue, Chicago 39, Illinois		
TYPE SET	Television Receiver with Remote Control		
TUBES	TV: VHF-Sixteen, UHF-Seventeen, Remote Control: Six		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	TV (Manual) 180 Watts, 1.75 Amp. @ 117 Volts AC TV (Automatic) 210 Watts, 2 Amp. @ 117 Volts AC While Tuning 235 Watts, 2.3 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL MODEL D2015L

For picture tube and safety glass cleaning, it is necessary to remove the chassis. (See "Disassembly Instructions".)

FUSE

One fuse is used for low voltage supply protection. (For location, see "Tube Placement Chart".)
One fuse wire is used for filament protection. (For location, see M3 in photo "Chassis Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of a Fringe Lock control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width coil. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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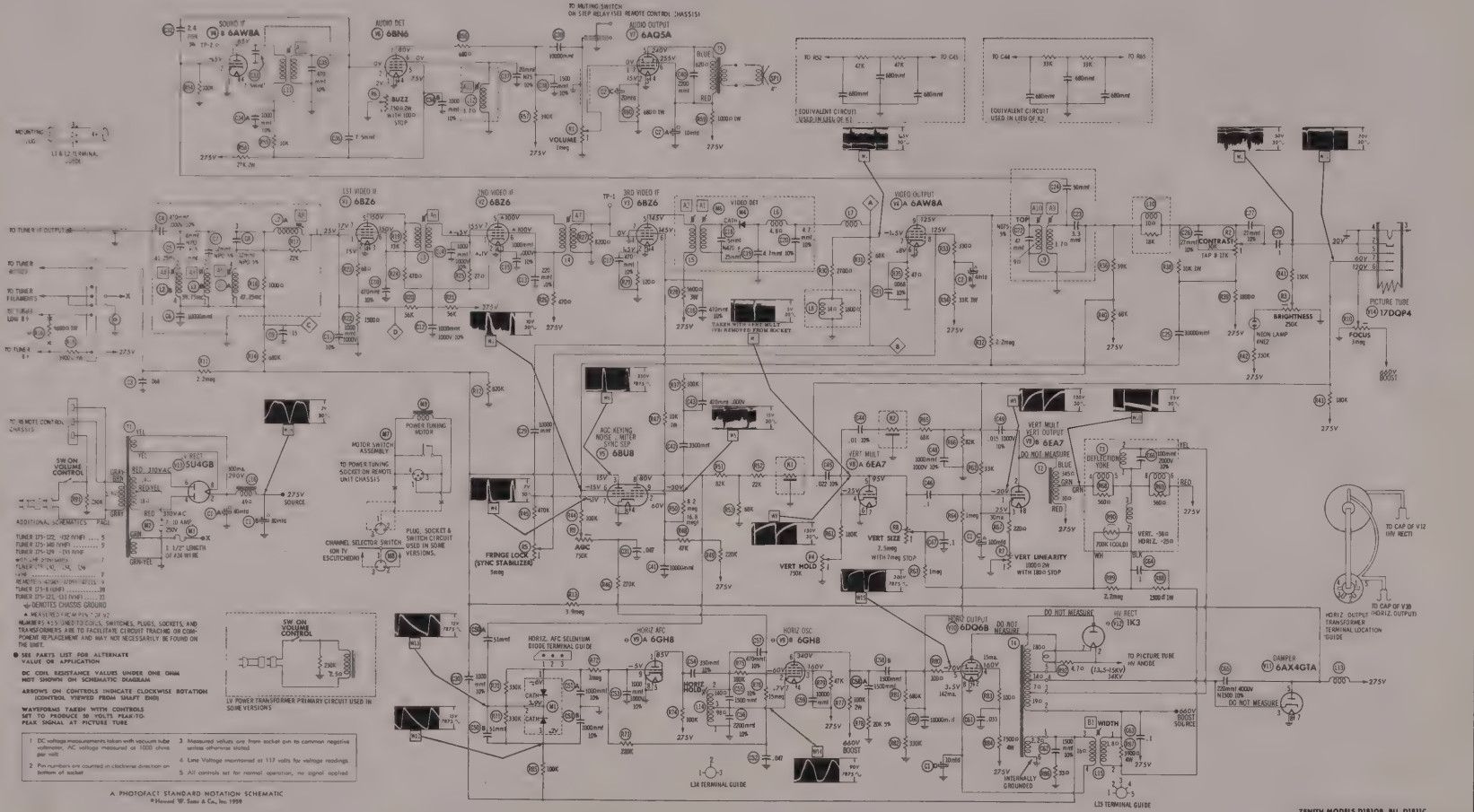
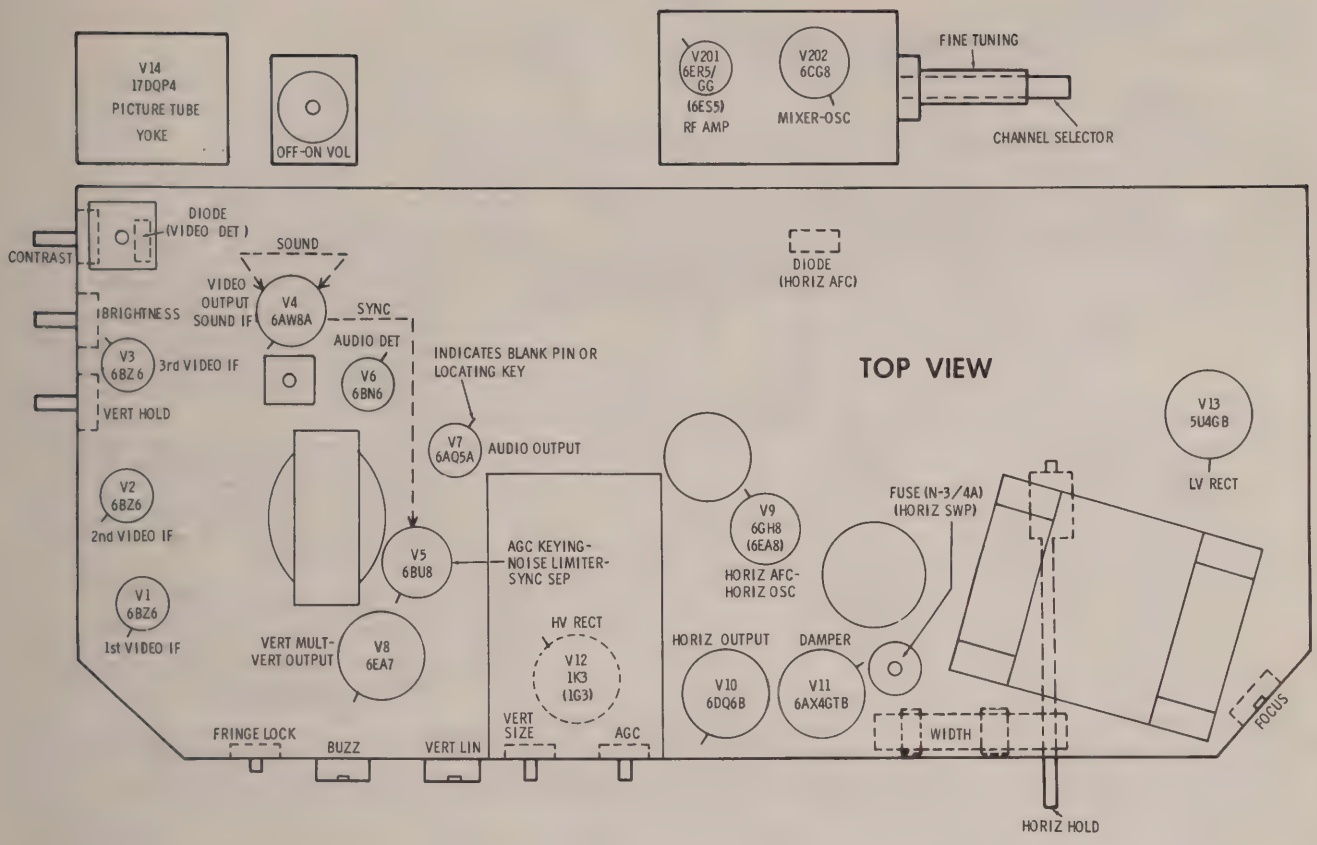
JA645

SET 466 FOLDER 2


SOUND IF
6AW8A
AUDIO DET
6BN6
AUDIO OUTPUT
6AQ5A
TO MUTING SWITCH ON STEP RELAY (SEE REMOTE CONTROL CHASSIS)
BUZZ
150 Ω 2W WITH 1000 Ω STUB
VOLUME
1 meg
EQUIVALENT CIRCUIT USED IN LIEU OF R1
EQUIVALENT CIRCUIT USED IN LIEU OF R2
1ST VIDEO IF
6BZ6
2ND VIDEO IF
6BZ6
3RD VIDEO IF
6BZ6
VIDEO DET
VIDEO OUTPUT
6AW8A
CONTRAST
TAP @ 17K
BRIGHTNESS
250K
NEON LAMP
NE2
PICTURE TUBE
17DQP4
FOCUS
3 meg
660V BOOST
TAKEN WITH VERT MULT (V9) REMOVED FROM SOCKET
TO TUNER IF OUTPUT
TO TUNER
TO TUNER FILAMENTS
TO TUNER LOW B+
TO TUNER B+
SW ON VOLUME CONTROL
5U4GB
275V SOURCE
ADDITIONAL SCHEMATICS
TUNER 175-122 -132 (VHF) 5
TUNER 175-140 (VHF) 5
TUNER 175-129 -159 (VHF) 6
TUNER 175-[illegible] (VHF) 7
REMOTE [illegible] 9
TUNER 175-8 (UHF) 39
TUNER 175-122, -132 (VHF) 23
DENOTES CHASSIS GROUND
MEASURED FROM PIN 7 OF V2
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated.
4 Line Voltage maintained at 117 volts for voltage readings.
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1959
MOTOR SWITCH ASSEMBLY
TO POWER TUNING MOTOR ON REMOTE UNIT CHASSIS
POWER TUNING MOTOR
CHANNEL SELECTOR SWITCH
PLUG, SOCKET & SWITCH CIRCUIT USED IN SOME VERSIONS.
AGC KEYING NOISE LIMITER SYNC SEP
6BU8
FRINGE LOCK (SYNC STABILIZER)
5meg
AGC
750K
VERT MULT
6EA7
VERT MULT VERT OUTPUT
6EA7
DO NOT MEASURE
VERT SIZE
7.5meg WITH 2meg STOP
VERT LINEARITY
100Ω 2W WITH 180Ω STOP
VERT HOLD
750K
DEFLECTION YOKE
VERT. -3Ω HORIZ. -25Ω
70K (OOLD)
TO CAP OF V12 (HV RECT)
TO CAP OF V20 (HORIZ. OUTPUT)
HORIZ. OUTPUT TRANSFORMER TERMINAL LOCATION GUIDE
HORIZ. AFC SELENIUM DIODE TERMINAL GUIDE
HORIZ AFC
6GH8
HORIZ OSC
6GH8
HORIZ OUTPUT
6DQ6B
HV RECT
1K3
TO PICTURE TUBE HV ANODE
(13.5-15KV) 54KV
DAMPER
6AX4GTA
660V BOOST SOURCE
WIDTH
INTERNALLY GROUNDED
L34 TERMINAL GUIDE
L35 TERMINAL GUIDE
SW ON VOLUME CONTROL
LV POWER TRANSFORMER PRIMARY CIRCUIT USED IN SOME VERSIONS
ZENITH MODELS D1810B, BU, D1811C, CU, D1812L, LU, D1814P, PU, D2010C, D2015L (Ch. 16D25, Q, U)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound V13

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V14
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, V13
Vert. off freq. V8
Horiz. off freq. Rect. (Horiz. AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5
No horiz. sync V5, Rect. (Horiz. AFC)
No vert. or horiz. sync V5

ZENITH MODELS D1810B, BU, D1811C, CU, D1812L, LU, D1814P, PU, D2010C, D2015L (Ch. 16D25, Q, U)

FOLDER 2

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470mmf	High side to TP-1. Low side to chassis.	44MC (10MC Swp)	39.75MC 45.75MC	Between any two channels	Vert. Amp. thru 10K to point Ⓐ. Low side to chassis. (A-cross Video Det. load)	A1, A2	Set sweep generator output to produce 3 volts peak to peak on scope. Adjust A1 and A2 alternately for maximum gain and symmetry with the 45.75MC marker positioned as shown in Fig. 1. The 39.75MC marker can fall within ±.5MC of the specified frequency. If the desired response cannot be obtained, check to see that the cores are entering their respective windings from opposite ends of the coils.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. (V202). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3, A4, A5	Connect a clip lead from point Ⓑ to chassis Connect another clip lead from point Ⓒ to point Ⓓ. Use high scope gain and adjust A3 thru A5 for MINIMUM marker amplitudes as in Fig. 2. A3 controls 39.75MC marker, A4 controls 41.25MC marker and A5 controls the 47.25MC marker.
3.	"	"	"	41.25MC 42.75MC 45.0MC 45.75MC	"	"	A6, A7, A8 & Mixer Plate Coil	Disconnect end of clip lead from point Ⓓ and connect to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. A6 affects low side of curve and A7 affects high side. Remove clip leads.

SOUND IF ALIGNMENT

Connect an adjustable attenuator between the antenna and the receiver antenna terminals. Tune in a TV station and adjust the attenuator until the signal is below the limiting level of the 6BN6 as evidenced by a hiss similar to super-regeneration in the sound. Adjust A9, A10, A11, A12, and the Buzz control (R6) for best quality sound and MINIMUM buzz. If the hiss disappears during alignment, further reduce the signal until the hiss returns.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 6, 13

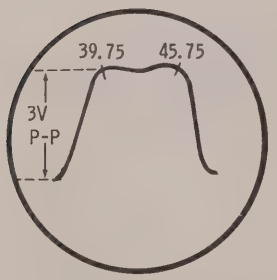


FIG. 1

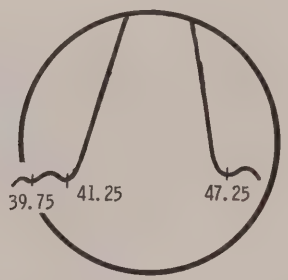


FIG. 2

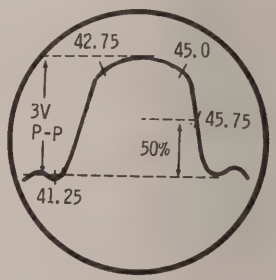
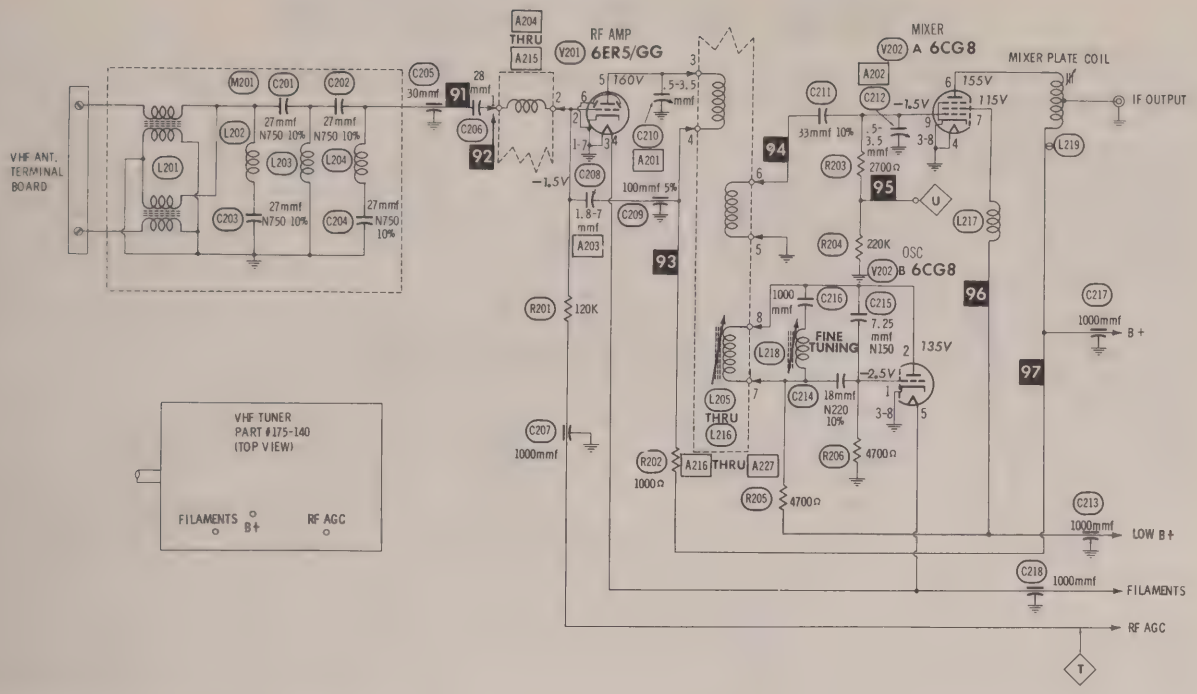


FIG. 3



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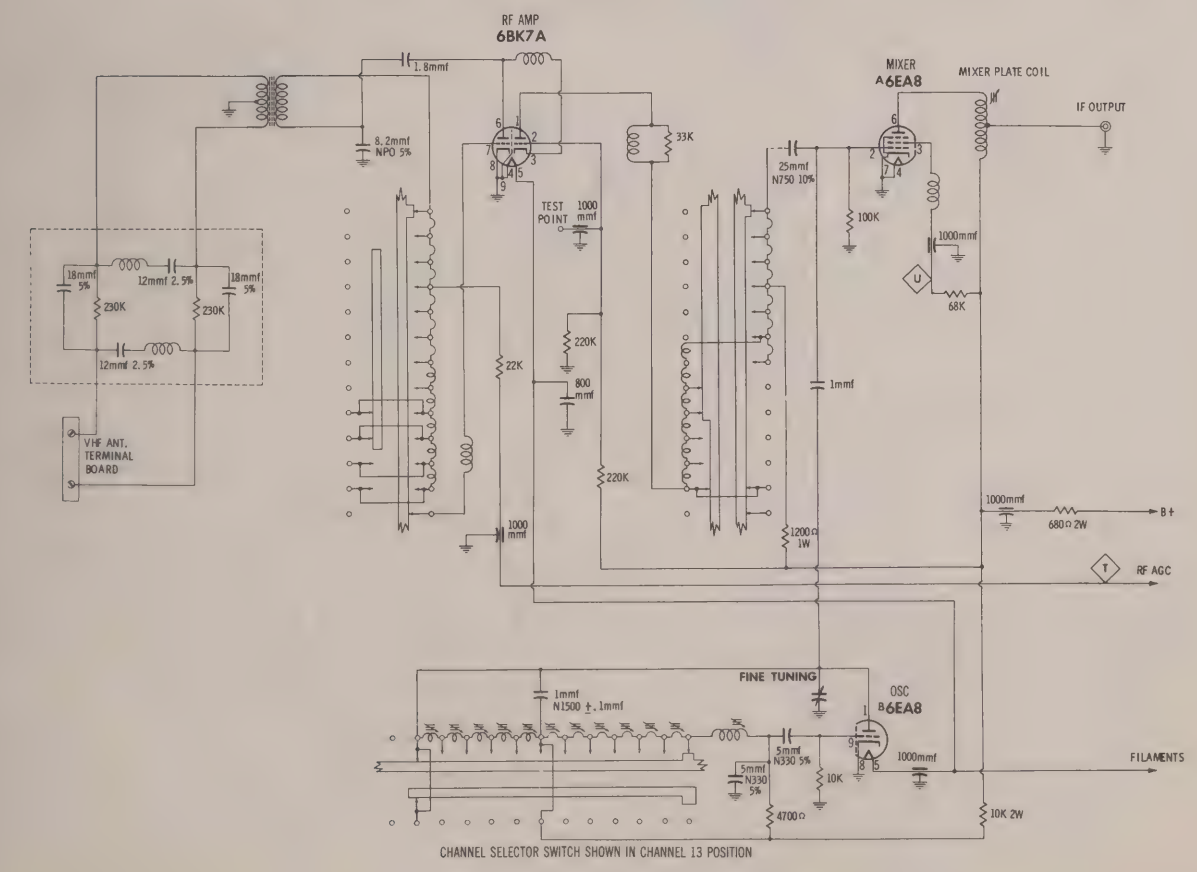
VHF TUNER 175-140



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VHF TUNER 175-122, -132

TUNER ALIGNMENT INSTRUCTIONS

175-129, -130, -133, -134, -136, -140

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: GENERAL CEMENT
WALSCO

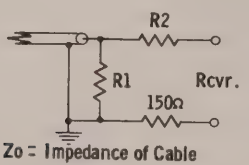
VHF OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range by turning the Fine Tuning shaft until the small index hole in the drive cam is directly over the small hole just below the channel 13 oscillator adjustment screw. Starting with the highest channel operating in the area, adjust the appropriate oscillator adjustment screw for best picture and sound for each channel available.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2 volt bias supply to point (T). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usuable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru matching network (Fig. 201).	213MC	211.25MC 215.75MC	13	Vert. amp. thru 10K to point (U). Low side to chassis.	A201	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown.
2.	"	"	207MC	205.25MC 209.75MC	12	"	A202	"
3.	"	"	201MC	199.25MC 203.75MC	11	"	A203	"
4.	"	"	195MC	193.25MC 197.75MC	10	"	A204	"
5.	"	"	189MC	187.25MC 191.75MC	9	"	A205	"
6.	"	"	183MC	181.25MC 185.75MC	8	"	A206	"
7.	"	"	177MC	175.25MC 179.75MC	7	"	A207	"
8.	"	"	85MC	83.25MC 87.75MC	6	"	A208, A209	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust first coil for proper marker position and second coil for maximum gain and symmetry.
9.	"	"	79MC	77.25MC 81.75MC	5	"	A210, A211	"
10.	"	"	69MC	67.25MC 71.75MC	4	"	A212, A213	"
11.	"	"	63MC	61.25MC 65.75MC	3	"	A214, A215	"
12.	"	"	57MC	55.25MC 59.75MC	2	"	A216, A217	"



Zo = Impedance of Cable

Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG. 201

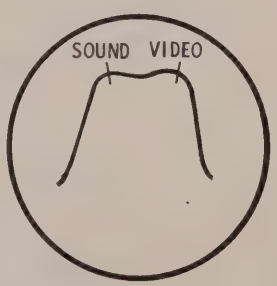
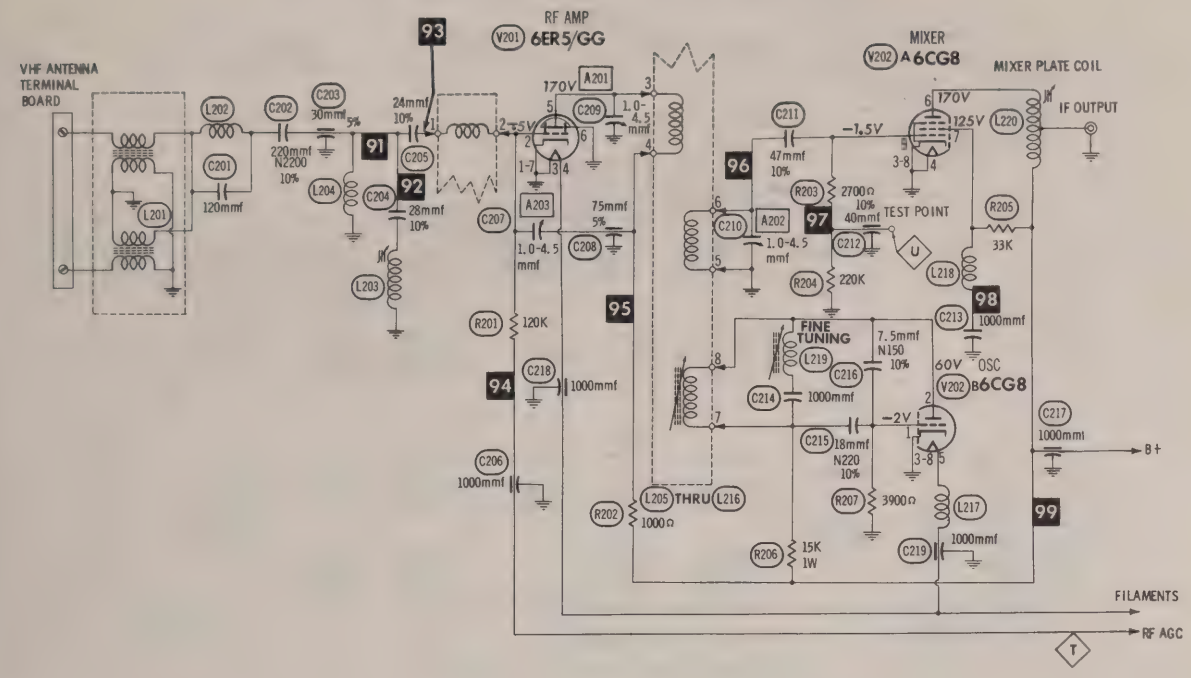


FIG. 202



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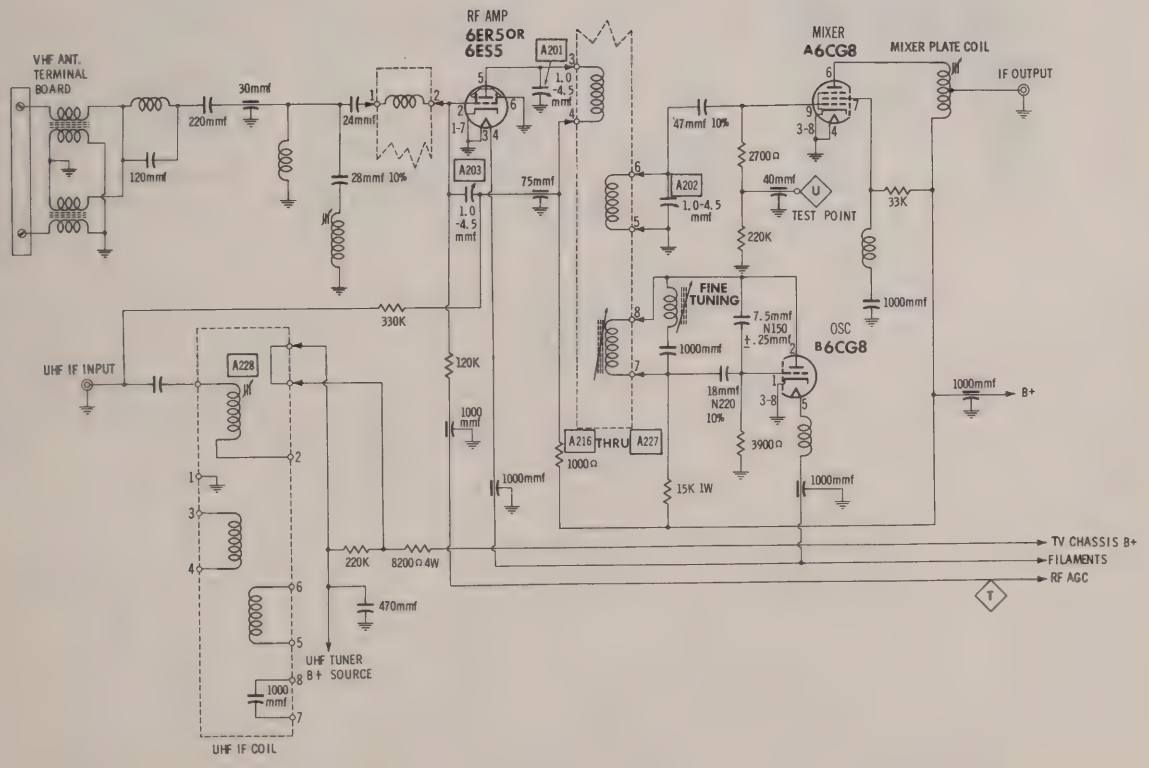
VHF TUNER 175-130, -134, -136



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VHF TUNER with UHF provisions 175-129, -133

TUNER
175-130
PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V201	RF Amplifier	6ER5/ GG(6ES5) *
V202	Mixer-Osc.	6CG8

* Alternate

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 N2200 10%	#22-3060				*		
C202	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C203	30 5%	#22-3111						
C204	28 10%		NPO-DI 25	TCZ-27	C10Q27C	CCD-270	GP429	10TS-Q27
C205	24		NPO-DI 25	DTZ-25	C10Q24C	CCD-250	GP425	10TS-Q25
C206	1000		EF-001	MFT-1000		CCF-102	CT280A	
C207	1-4.5	#22-3148		829-6				
C208	75	#22-3147						
C209	1-4.5	#22-3148		829-6				
C210	1-4.5	#22-3148		829-6				
C211	47 10%		NPO-DI 47	DTZ-47	C10Q47C	CCD-470	GP447	10TS-Q47
C212	40 10%	#22-3112						
C213	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C214	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C215	18 N220 10%	#22-3025						10TCR-Q18
C216	7.5 N150 10%	#22-3026						10TCP-V82
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
\# Zenith Part Number.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	120K	
R202	1000Ω	
R203	2700Ω	

ITEM No.	RATING	REMARKS
R204	220K	
R205	33K	
R206	15K 1W	

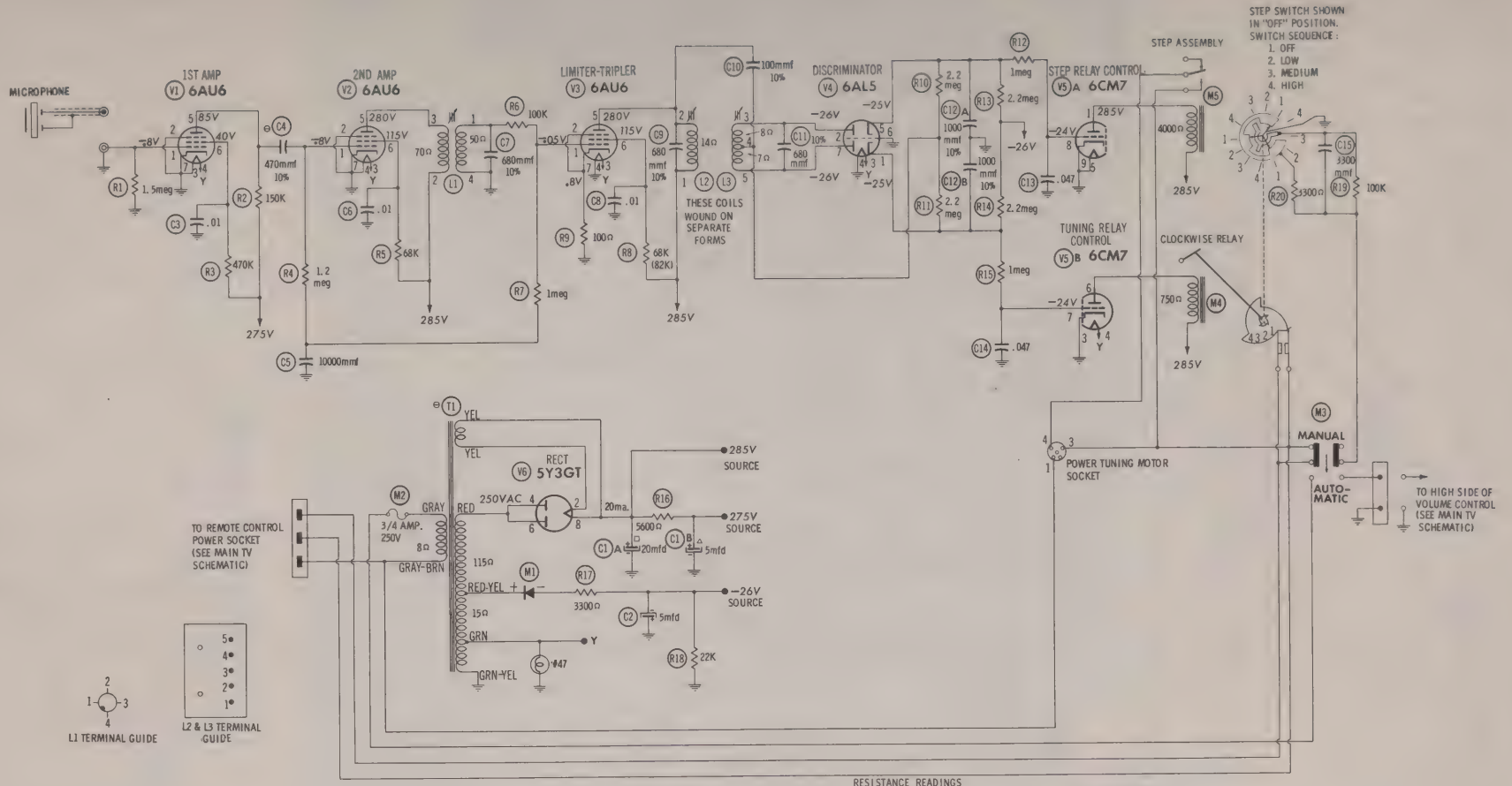
ITEM No.	RATING	REMARKS
R207	3900Ω	

COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L201	Ant. Trans. Assy.	S-47666	
L202	RF Choke	20-657 †	
L203	IF Trap Coil	S-40497	
L204	RF Choke	20-756	
L205	Ant., RF, Mixer Grid & Osc. Coils	174-2	Channel 2
L206	"	174-3	Channel 3
L207	"	174-4	Channel 4
L208	"	174-5	Channel 5
L209	"	174-6	Channel 6
L210	"	174-7	Channel 7

ITEM No.	USE	ZENITH PART No.	NOTES
L211	Ant., RF, Mixer Grid & Osc. Coils	174-8	Channel 8
L212	"	174-9	Channel 9
L213	"	174-10	Channel 10
L214	"	174-11	Channel 11
L215	"	174-12	Channel 12
L216	"	174-13	Channel 13
L217	Fil. Choke	20-734	
L218	RF Choke	20-721	
L219	Fine Tuning Coil	S-43559	Includes Assy.
L220	Mixer Plate Coil	S-45638	

† Part of L201.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AU6	1.5meg	0Ω	.1Ω	0Ω	††155K	††475K			
V2	6AU6	2.3meg	0Ω	.1Ω	0Ω	††70Ω	††68K	0Ω		
V3	6AU6	100K	100Ω	.1Ω	0Ω	††14Ω	††68K	100Ω		
V4	6AL5	1.8meg	2.5meg	.1Ω	0Ω	1.8meg	0Ω	2.5meg		
V5	6CM7	††4000Ω	TP	0Ω	.1Ω	0Ω	††750Ω	3meg	3meg	0Ω
V6	5Y3GT	NC	¶	NC	130Ω	NC	130Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 8 OF V6.
NC NO CONNECTION
TP TIE POINT

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REMOTE CONTROL S-47043, S-47053, S-47113

ZENITH MODELS D1810B, BU, D1811C, CU, D1812L, LU, D1814P, PU, D2010C, D2015L (Ch. 16D25, Q, U)

REMOTE CONTROL
S-47043
PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	1st RF Amp.	6AU6
V2	2nd RF Amp.	6AU6
V3	Limiter Trippler	6AU6
V4	Discriminator	6AL5
V5	Step Relay Control-Tuning Relay Control	6CM7
V6	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■20	350	22-3122	AFH2-50	B0390	TMD-35	TMD-49	TVL-2760	
B	▲5	350							
C2	5	50	22-3206	PRS1310	BBR5-50	TC30	TD-5-50	TVA-1303	Note 1

Note 1. Ch. S-47053 and S-47113 use 5mfd,50V (Part #22-2941).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C4	470 10%		1469-00047	DD-471	5R5T47	CM-20B-471K	MCB245	MS-347
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C7	680 10%		1469-00068	DD-681	1R5T68	CM-20B-681K	MCJ249	MS-368
C8	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C9	680 10%		1469-00068	DD-681	1R5T68	CM-20B-681K	MCJ249	MS-368
C10	100 10%		1469-0001	DD-101	22R5T1	CM-20B-101K	MCB235	MS-310
C11	680 10%		1469-00068	DD-681	1R5T68	CM-20B-681K	MCJ249	MS-368
C12A	1000 10%	#22-21	DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
B	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C13	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C14	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C15	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	1.5meg	
R2	150K	
R3	470K	
R4	1.2meg	
R5	68K	
R6	100K	
R7	1meg	

ITEM No.	RATING	REMARKS
R8	68K	(82K) *
R9	100Ω	
R10	2.2meg	
R11	2.2meg	
R12	1meg	
R13	2.2meg	
R14	2.2meg	

ITEM No.	RATING	REMARKS
R15	1meg	
R16	5600Ω	
R17	3300Ω	
R18	22K	
R19	100K	
R20	3300Ω	

* Alternate.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	39.5KC Trans.	S-43725						
L2	Discriminator Pri.	S-24788						
L3	Discriminator Sec.	S-24789						

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .36A	250V @ .020A tap @ 40V @ .0015A tap @ 6.3V @ 1.7A	5V @ 2A	95-1697						
	117V @ .5A	220V @ .040A tap @ 3.2V @ .001A tap @ 6.3V @ 2.8A		95-1612 ①						

① Used in Models S-47113, S-47053.

continued PAGE 19

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENTIFICATION

TUNER ALIGNMENT INSTRUCTIONS

175-121, -122, -131, -132

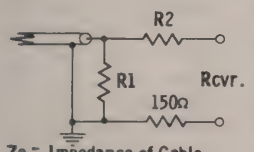
PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 ... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A216 thru A227 ... GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru matching transformer (Fig. 201).	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	



Zo = Impedance of Cable

Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG. 201

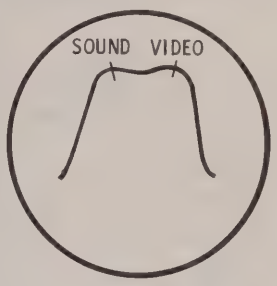


FIG. 202

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Fig. 201	Across antenna terminals thru matching transformer (Fig. 201).	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A216	Adjust to place sound marker in trap notch as in Fig. 203. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

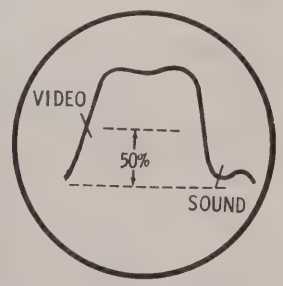


FIG. 203

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	CBS · GENERAL ELECTRIC · RAYTHEON · SYLVANIA		ITEM No		
	USE	TYPE		USE	TYPE
V1	1st Video IF Amp	6BZ6	V7	Audio Output	6AQ5A
V2	2nd Video IF Amp	6BZ6	V8	Vert. Mult.-Vert. Output	6EA7
V3	3rd Video IF Amp	6BZ6	V9	Horiz. AFC-Horiz. Osc.	6CG8 (6EA8) *
V4	Video Output-Sound IF Amp.	6AW8A	V10	Horiz. Output	6DQ6B
V5	AGC Keying-Noise Limiter -Sync Sep	6BU8	V11	Damper	6AX4GTB
V6	Audio Detector	6BN6	V12	HV Rect.	1K3 (1G3)*
			V13	LV Rect.	5U4GB

* Alternate.

PICTURE TUBE

ITEM No	REPLACEMENT DATA					NOTES
	ZENITH PART No	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V14	17DQP4 ①			17DQP4 ②		① Aluminized. ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	ZENITH PART No	AEROVOX PART No.	CORNELL-DUBILIER PART No.	P.R. MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	⌀40	600	22-3213	AFH4-100-40	D0477.5	FP420.6	TMT-189 TD-40-450	TVL-4663.4	
B	⌀80	600							
C	⌀100	50							
D	10	25							
C2A	⌀40	600	22-2744		C0739	FP533.7	TMT-217	TVL-3655	
B	⌀4	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING	REMARKS	REPLACEMENT DATA							NOTES
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	ZENITH PART No.	
C3	.068 200V		P488N-068	DD16-702	CUB4S6	4DP-3-563	GEM-4166	4TM-S68	10TC-V39	
C4	470 1000V 10%		1468-HV-00047 10%	DD-471		VCM-20-471K		10TS-T47		
C5	4 NPO ± .5mmf				C10V4C				10TCC-V39	
C6	10000		BPD-01	DD-103	BYA10SL	CCD-103	B-110	5HK-S10		
C7	12 NPO 5%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12		
C8	12 NPO 5%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12		
C9	15 200V		P288N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15		
C10	470 10%		DL-470	DD-471	5R5T47	CCD-471	GP447	10TS-T47		
C11	1000 1000V 10%		DL-1000	DD-102		CCD-102	GP210	10TS-D10		
C12	1000 1000V 10%		DL-1000	DD-102		CCD-102	GP210	10TS-D10		
C13	220 10%		DL-221	DD-221	22R5T22	CM-20B-221K	MCB227	MS-227		
C14	1000 1000V 10%		DL-1000	DD-102		CCD-102	GP210	10TS-D10		
C15	1000 1000V 10%		DL-1000	DD-102		CCD-102	GP210	10TS-D10		
C16	470 10%		1469-00047	DD-471	5R5T47	CM-20B-471K	MCB245	MS-247		
C17	470 10%		DL-470	DD-471	5R5T47	CCD-471	GP447	10TS-T47		
C18	5 N470 ± .25mmf	#22-2990								
C19	4.7 10%		NPO-SE 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47		
C20	4.7 10%		NPO-SE 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47		
C21	.0068 200V 10%		V84C6D68		PM6D68	6DP-1-682		6TM-D68		
C22	47 .5075 5%	#22-3467								
C23	3.3		NPO-SE 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33		
C24	50		NPO-SE 50	TCZ-50	L10Q5	CCTO-500	CNO-550	10TCC-Q50		
C25	10000		BPD-01	DD-103	BYA10SL	CCD-103	B-110	5HK-S10		
C26	27 10%		NPO-SE 27	TCZ-27	L10Q27	CCD-271	CNO-427	10TCC-Q27		
C27	27 10%		NPO-SE 27	TCZ-27	L10Q27	CCD-271	CNO-427	10TCC-Q27		
C28	.1 200V		P288N-1		DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1	
C29	10000		BPD-01	DD-103	BYA10SL	CCD-103	B-110	5HK-S10		
C30	1000 10%		DL-1000	DD-102	1R5DN	CCD-102	GP210	10TS-D10		
C31	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47		
C32	3.4 5%		NPO-SE 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33		
C33	7.5			DD-7R5	C10V7C			10TCC-V75		
C34A	1000 10%	#22-21	DL-1000	DD-102	PM6DL	CCD-102	GP210	10TS-D10		
B	1000 10%		DL-1000	DD-102	PM6DL	CCD-102	GP210	10TS-D10		
C35	470 10%		1469-00047	DD-471	5R5T47	CM-20B-471K	MCB245	MS-247		
C36	7.5			DD-7R5	C10V5C			10TS-V75		
C37	30 NTB 10%	#22-3130								
C38	1500 10%		DL-1500	DD-152	PM6DL5	CCD-152	GP215	10TS-D15		
C39	10000		BPD-01	DD-103	BYA10SL	CCD-103	B-110	5HK-S10		
C40	2200		BPD-0022	DD-223	BYA10S22	CCD-223	B-122	5HK-S22		
C41	10000		BPD-01	DD-103	BYA10SL	CCD-103	B-110	5HK-S10		
C42	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33		
C43	470 1000V		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47		
C44	.01 200V 10%		V84C2S		PM4S2	4DP-1-103	GEM-1611	4TM-S2		
C45	.022 400V 10%		V84C4S22		PM4S22	4DP-2-223	GEM-1612	4TM-S22		
C46	1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1		
C47	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1		
C48	1000 1000V 10%		DL-1000	DD-102		CCD-102	GP210	10TS-D10		
C49	.025 1000V 10%					1HDP-4-253	GEM-161125	10TM-S25		
C50A	51	#22-3	DL-50	DD-510	L10Q51	CCD-500	GP450	5GA-Q50		
B	51		DL-50	DD-510	L10Q51	CCD-500	GP450	5GA-Q50		
C51A	1000 10%	#22-21	DL-1000	DD-102	PM6DL	CCD-102	GP210	10TS-D10		
B	1000 10%		DL-1000	DD-102	PM6DL	CCD-102	GP210	10TS-D10		
C52	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47		
C53	1000 1000V 10%		DL-1000	DD-102		CCD-102	GP210	10TS-D10		
C54	330 10%		1469-00033	DD-331	5R5T33	CM-20B-331K	MCB241	MS-333		
C55	1500 10%		1464-0015	DD-152	1R5D15	CM-20B-152K	MCB456	MS-215		
C56	2200 10%		1464-0022		1R5D22	CM-20B-222K	MCJ459	MS-222		
C57	470 10%		DL-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47		
C58A	1500		BPD-1.5X0015	DD5-152	BTC5D152	CCD-152A	B1X015	5EK-S15		
B	1500					CCD-152				
C59	10000		BPD-01	DD-103	BYA10SL	CCD-103	B-110	5HK-S10		
C60	10000		BPD-01	DD-103	BYA10SL	CCD-103	B-110	5HK-S10		
C61	.033 400V		P488N-033	DF-303	CUB4S33	4DP-3-333	GEM-4133	4TM-S33		
C62	1500 10%		DL-1500	DD-152	PM6DL5	CCD-152	GP215	10TS-D15		
C63	1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1		
C64	1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1		
C65	200 4000V N1500 10%	#22-3214				*				
C66	100 2000V 10%				HVD20Q1	VCM-20-101K	2DY-310			

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# Zenith Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	83-4680				FP15L	Volume
B	Switch						D8-37	Push-Pull Off-On
R2	30K	½	83-4639				U7-45	Contrast
	17K Tap							
R3A	250K	½	83-4492	AB-50	A47-250K-S	QU-130	U46	Brightness
B	Shaft			AK-8	RS-3/16	NQ	D8-37	
R4A	750K	½	83-4491	AB-86	A47-750K-S	QU-136	U54	Vert. Hold
B	Shaft			AK-8	RS-3/16	NQ	D8-37	
R5A	1meg	½	83-4050	AB-27	B47-1meg-S	BU-141	FTA56L	Fringe Lock (Sync Stab)
B	Shaft			AK-19	Not Req.	T364	Not Req.	
R6	750Ω	2(W)	83-3294		39-800 *	113-800 *	FL-750 *	Buss Control
	1000 Stop							
R7	1000Ω	2(W)	83-4485		39-1000 †	112-1000 †	FL-1K †	Vert. Lin.
	1500 Stop							
R8A	17 5meg	½	83-4647	AB-90 †	B47-7.5meg -S †	B11-142 †	SU-89 †	Vert. Size
	7meg Stop							
B	Shaft			AK-19	Not Req.	T364	Not Req.	
R9A	750K	½	83-3293	AB-86	A47-750K-S	B11-136	FTA75AL	AGC
B	Shaft			AK-19	R37-3	T364	Not Req.	
R10A	2meg	½	83-4655	AB-84	B47-2meg-S	B11-140	SU-59	Focus
B	Shaft			AK-19	Not Req.	T364	Not Req.	

* Use 100Ω resistor in series with terminal. † Use 180Ω resistor in series with terminal.
† Use 470K resistor in series with right hand terminal. (Viewed from shaft end, terminals down.)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R11	2.2meg	
R12	820K	
R13	3.9meg	
R14	680K	
R15	3900Ω 3W	
R16	5600Ω 1W	Note 1
R17	22K	
R18	1000Ω	
R19	33K	
R20	56K	
R21	56K	
R22	1500Ω	
R23	68Ω	
R24	470Ω	
R25	270	
R26	470Ω	
R27	5200Ω	
R28	5600Ω 3W	
R29	120Ω	
R30	2700Ω	
R31	68K	
R32	2.2meg	
R33	330Ω	
R34	33K 1W	
R35	47Ω	
R36	39K	
R37	100K	
R38	10K 1W	

ITEM No.	RATING	REMARKS
R39	1800Ω	
R40	68K	
R41	150K	
R42	330K	
R43	180K	
R44	100K	
R45	470K	
R46	270K	
R47	10K 1W	
R48	47K	
R49	220K	
R50	8.2meg	(6.8meg) *
R51	82K	
R52	22K	
R53	68K	
R54	100K	
R55	10K	
R56	680Ω	
R57	390K	
R58	27K 2W	
R59	1000Ω 1W	
R60	680Ω 1W	
R61	180K	
R62	33K	
R63	1meg	
R64	1meg	
R65	68K	
R66	82K	

ITEM No.	RATING	REMARKS
R67	220Ω	
R68	560Ω	
R69	560Ω	
R70	330K	
R71	330K	
R72	1meg	
R73	220K	
R74	100K	
R75	100K	
R76	15meg	
R77	100K 2W	
R78	20K 5%	
R79	47K	
R80	100Ω	
R81	680K	
R82	330K	
R83	100Ω	
R84	7500Ω 4W	
R85	100K	
R86	33Ω	
R87	3900Ω 4W	#83-4684
R88	1500Ω 1W	
R89	2.2meg	
R90	700K Cold	#83-4648
R91	230K	#83-3607
R92	4.7Ω	

* Alternate. # Zenith Part Number. Note 1. Used only with VHF Tuner 175-140.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ZENITH PART No.	Gramer PART No.	Mensmer PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1A	47.25MC Trap	S-41883						
B	39.75MC Trap							Includes C5
L2A	1st Video IF	S-43992						
B	41.25MC Trap							
L3	2nd Video IF	S-42874	17-4523 ■	17-4523 ■	TV-130 ■	6234 ■	VF-3 ■	
L4	3rd Video IF	S-42839	17-4533 ■	17-4533 ■	TV-130 ■	6234 ■	VF-3 ■	
L5	4th Video IF	S-42734 †						
L6	Series Peaking Coil	S-41878 †	19-3093	19-3093	TV-151	6177	VP-3	90nh
L7	Resonant Choke	S-21888 †						0nh
L8	Shunt Peaking Coil	S-47906	19-6400 ♦	19-6400 ♦	TV-302 ♦	6136 ♦		413nh ①
L8A	Sound Take-Off	S-47907						
B	4.5MC Trap							
L10	Series Peaking Coil	S-47905	19-3250 ▲	19-3250 ▲	TV-185 ▲	6181 ▲	VP-6 ▲	238nh ②
L11	2nd Sound IF	S-46557						
L12	Quadrature Coil	S-45229	20-1005 ▲	20-1005 ▲	TV-121 ▲	1480 ▲		
L13	Resonant Choke	S-22777						10.4nh

† Part of M5. ▲ Parallel with 18K resistor. ① Wound on 1800Ω resistor.
■ Drill new mounting hole. ♦ Parallel with 1800Ω resistor. ② Wound on 18K resistor.
◆ Remove C37 (30mmf cap.)

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L14	238Ω		S-47150						Horiz. Osc. tapped ② 98Ω

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		ZENITH PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L15	Width Coil	S-46571								
A	Parallel (4-22MH)									
B	Series (.4-2.1MH)									

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~(.)	ZENITH PART No.	Halldorson PART No.	Merit PART No	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	.300A	49Ω	1.2 Hy	95-1863	28C44				28C44	C-28X

TRANSFORMER (POWER)

ITEM No	RATING			REPLACEMENT DATA						
	PRI	SEC 1	SEC 2	ZENITH PART No	Halldorson PART No.	Merit PART No	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117V ⑤ 1.75A	630VCT ⑤, .300A	6.3V ⑤ 3A	95-1867						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ⑤ 7.4A									

⑤ Use 6 to 1 turns ratio.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	Vert. Output	95-1700	28873	A-2854	V316 ⑮	VO38 ①	VO-100 ③	28873	A-118X ③	
T3	Yoke-Horiz. (15.6MH) (110°)-Vert. (41MH)	95-1668 ④							YC-1 & CL-1	
	Rear Cover & Centering Device	S-46554								
	Yoke Clamp	17-159								
T4	Horiz. Output	S-46564								

① Drill new mounting hole(s).
③ Cut and tape blanking lead.
④ Includes rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	5400Ω	3-4Ω	95-1865	24848 ①	A-3026 ①			24848 ①	S-5X ①	① Use original frame.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	49-887	4A1	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Vert. Integrator		87-5	Sprague V-15
K2	Vert. Feedback		87-4	Sprague V-14

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ZENITH PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1		103-20 ①	K1615 ①	SD-91 ②			① Dual Selenium Diode ② Silicon Type. Two required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						NOTES
			ZENITH PART No		LITTELFUSE PART No.		BUSS PART No		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M2	N	7/10A 250V S/B	126-39	62-21	333.750 (N 7/10A 250V S/B)	345010	N 7/10	HN 1/2 to 3/4	
M3		½" Length of #24 Wire							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		ZENITH PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M4		103-23	1N60	1N295	1N295	Video Det. (Pigtail)

ZENITH MODELS D1810B, BJ, D1811C, CU, D1812L, LU, D1814P, PU, D2010C, D2015L (Ch. 16025, Q, U)

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M5	Tuner	175-140	VHF Ch. 16D25Q
	Tuner	175-130	VHF Ch. 16D25
	Tuner	175-122	VHF Ch. 16D25
	Tuner	175-129	VHF with UHF provisions, Ch. 16D25U
	Tuner	175-121	VHF with UHF provisions, Ch. 16D25U
	Tuner	175-8	UHF Ch. 16D25U
M6	4th IF Assembly	S-46869	Includes L5, L6, C18, C19, C20 and M4
M7	Switch	S-41498	Motor Switch Assembly
M8	Switch	S-44018	Channel Selector
M9	Motor	141-153	
M10	Antenna	S-46769	Dipole, JFD Model TA373

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	192-280	
Knob	46-2181	Channel Selector, Model D1810B
Knob	46-2173	Channel Selector, Models D1811C, D1812L
Knob	46-2172	Channel Selector, Model D1814P
Knob	46-2174	Channel Selector, Model D2010C
Knob	46-2171	Channel Selector, Model D2015L
Knob	S-46280	Fine Tuning
Knob	S-43927	UHF Dial, Models D1810BU, D1811CU, D1812LU, D1814PU
Knob	S-45716	Volume
Knob	S-46665	Brightness, Vert. Hold, Contrast
Knob	S-46215	Horiz. Hold
Cabinet	14-2685	Model D1810B
Cabinet	14-2727	Model D1810BU
Cabinet	14-2871	Model D1811C
Cabinet	14-2876	Model D1811CU
Cabinet	14-2686	Model D1812L
Cabinet	14-2728	Model D1812LU
Cabinet	14-2687	Model D1814P
Cabinet	14-2729	Model D1814PU
Cabinet	14-2688	Model D2010C
Cabinet	14-2689	Model D2015L

WIRING DATA

High Voltage Lead	Use BELDEN No.	8809
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor

REMOTE CONTROL
PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

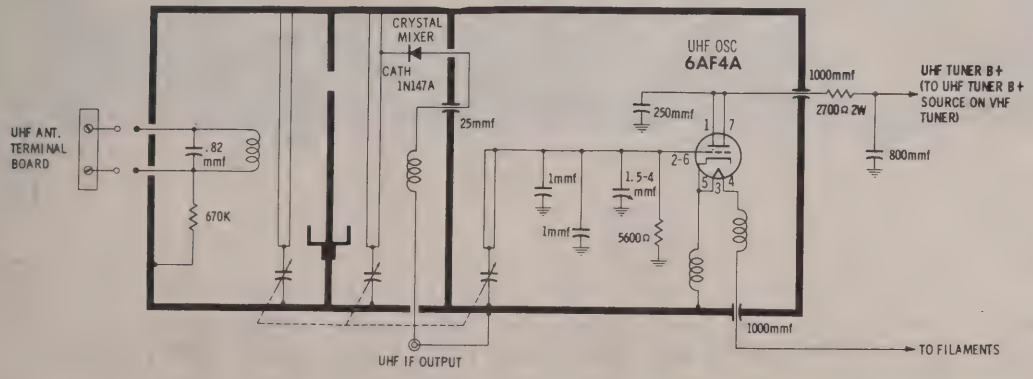
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ZENITH PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.0015	212-21 ①			12		① Selenium type.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3/4A 250V S/B	136-41	83-3027	312.750 (3AG 3/4A 250V S/B)	356001	MDL 3/4	4406

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Switch	85-580	Auto-Manual (DPDT Slide Type)
M4	Relay	195-5	Clockwise
M5	Relay	S-47379	Step Assy. Includes Step switch (Part #S-43848)
	Microphone	S-46826	Assembly, Ch. S-47113
	Microphone	S-46824	Assembly, Ch. S-47053
	Microphone	S-47486	Assembly, Ch. S-47043



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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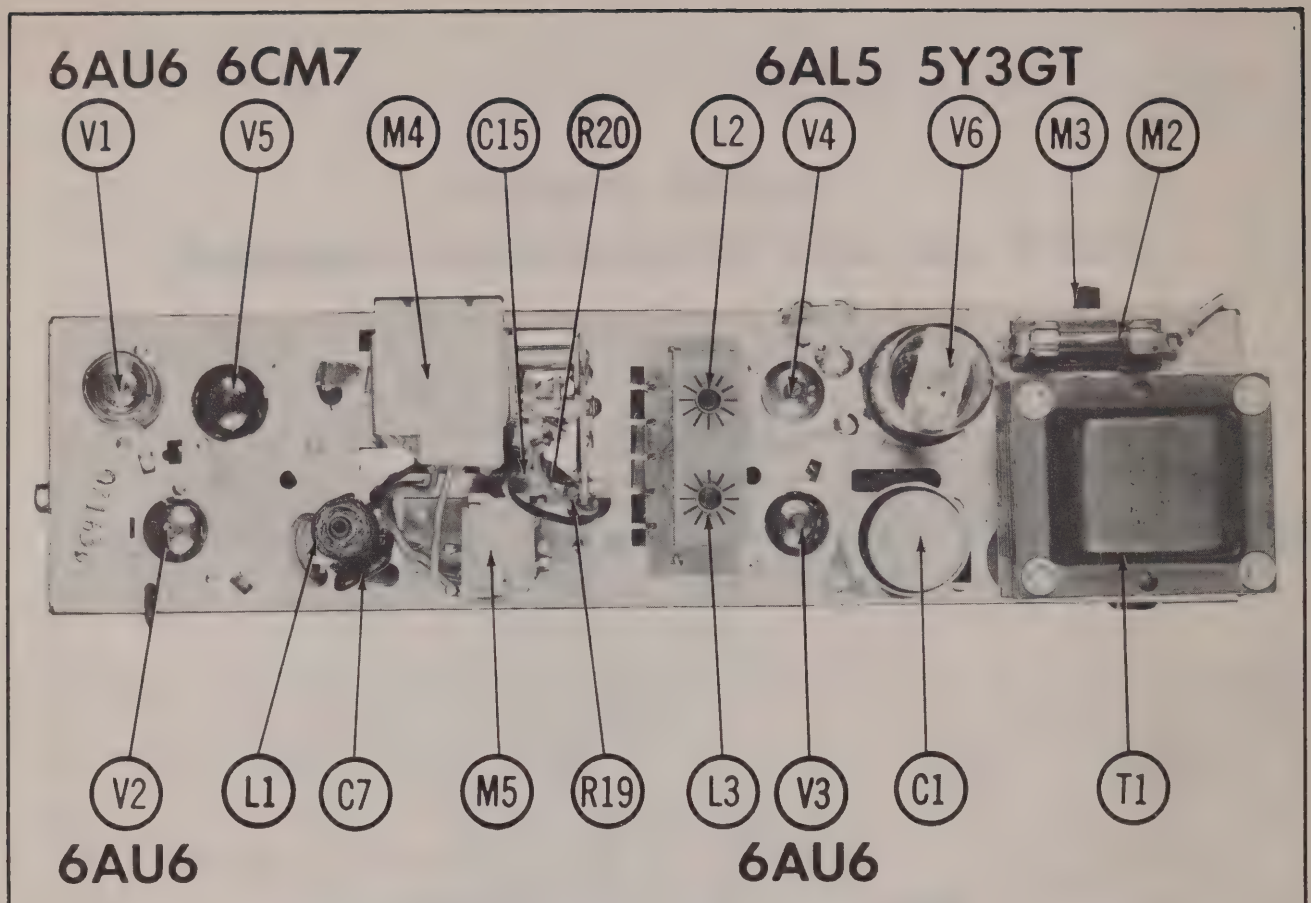
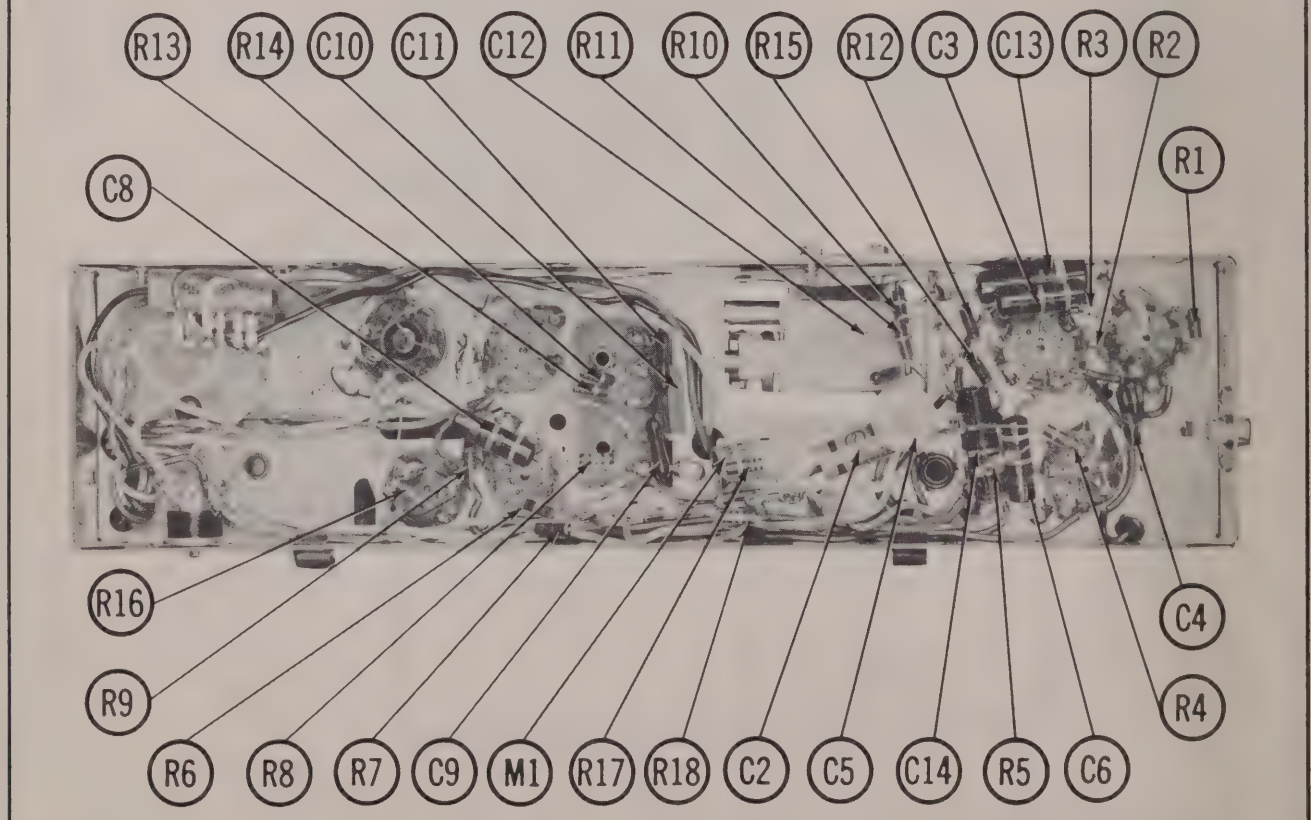
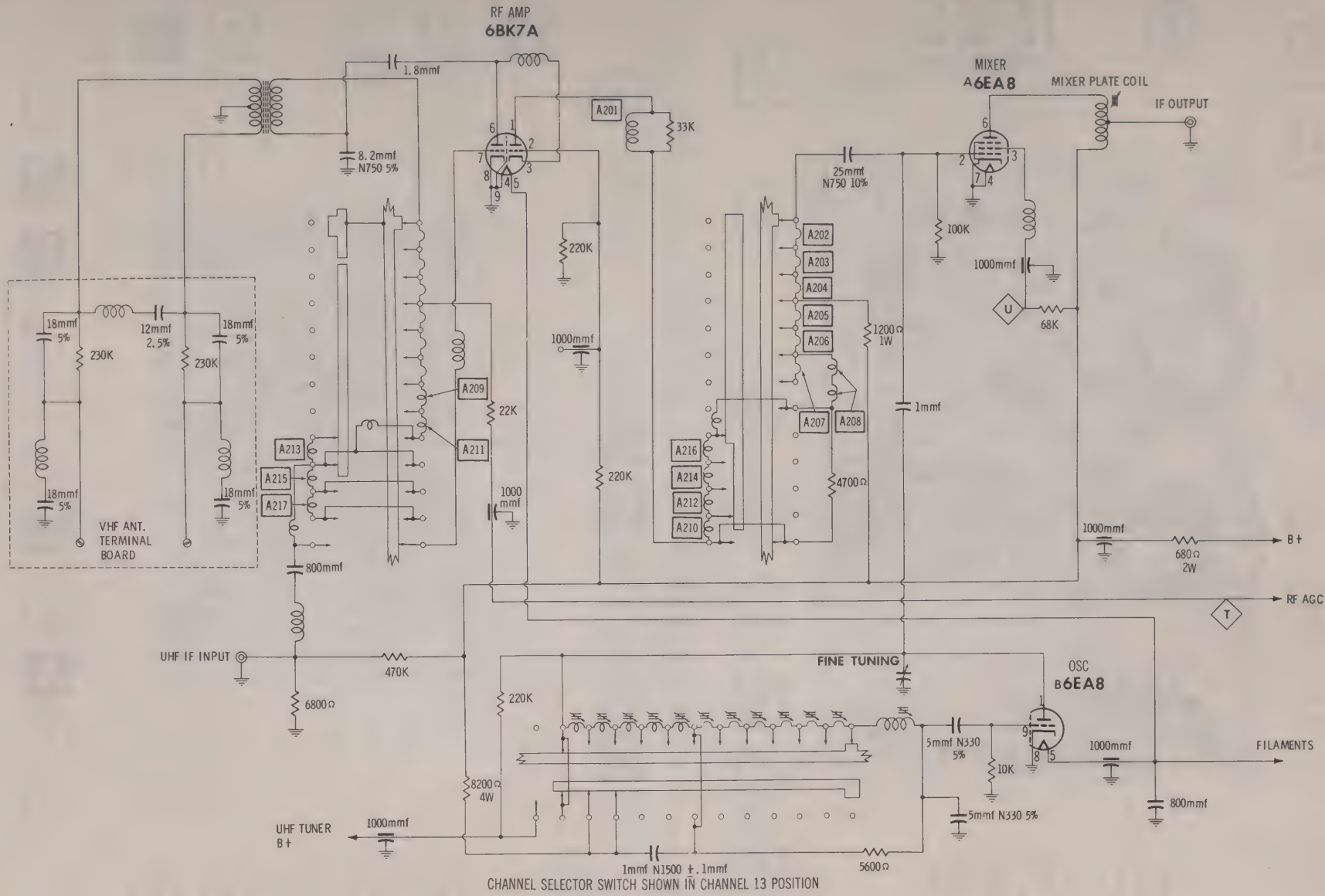
UHF TUNER 175-8



REMOTE CONTROL S-47043 - TOP VIEW



REMOTE CONTROL S-47043 - BOTTOM VIEW



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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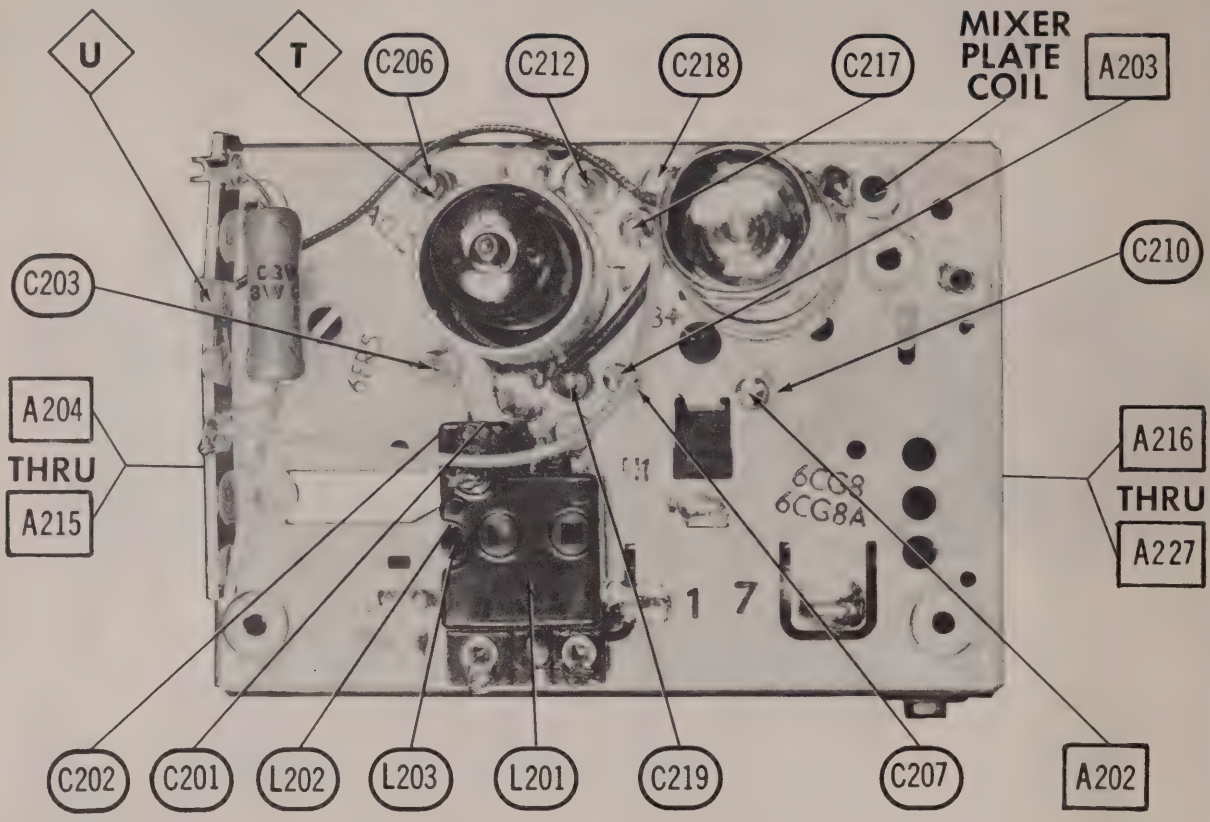
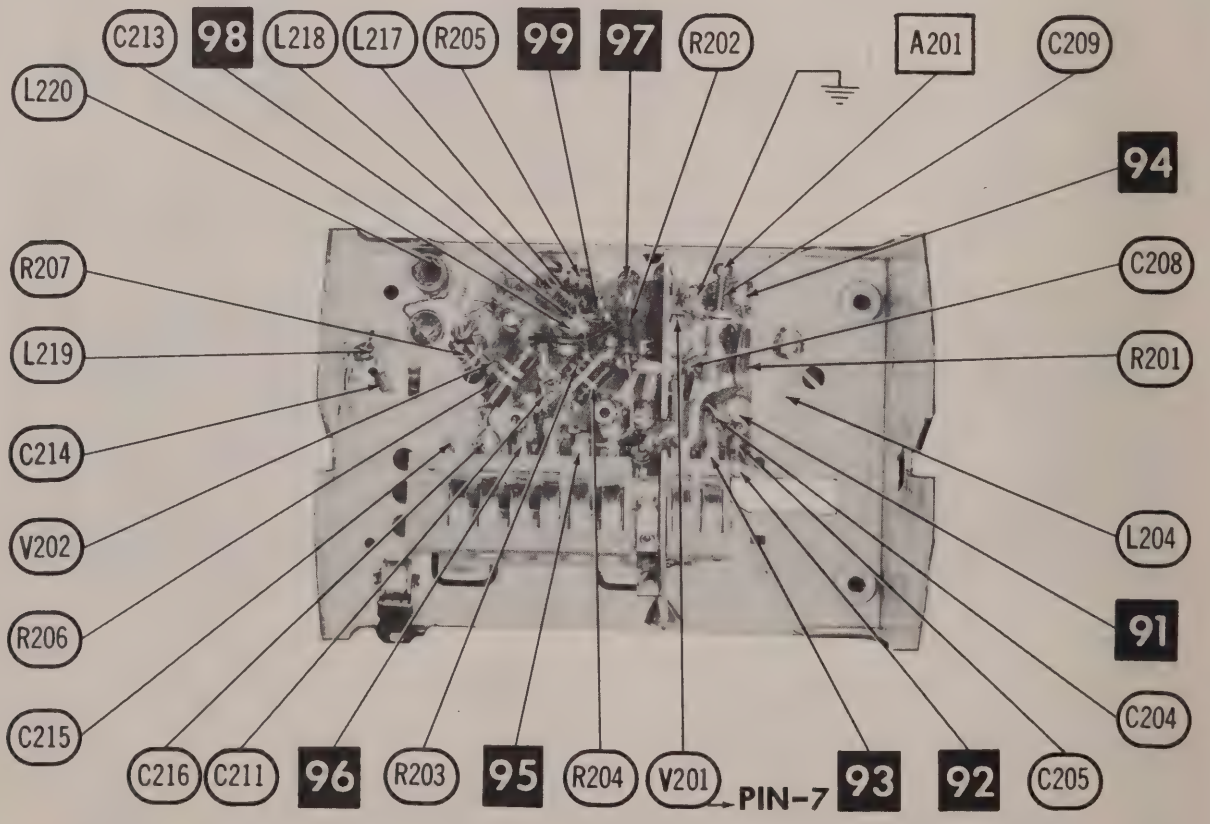
VHF TUNER with UHF provisions 175-121, -131

ZENITH MODELS D1810B, BU, D1811C, CU, D1812L, LU, D1814P, PU, D2010C, D2015L (Ch. 16D25, Q, U)



TUNER 175-130 - TOP VIEW



TUNER 175-130
BOTTOM VIEW

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

TUNER PARTS LIST AND DESCRIPTIONS
175-140

TUBES

• CBS •	GENERAL ELECTRIC •	RAYTHEON •	SYLVANIA •

ITEM No.	USE	TYPE
V201	RF Amplifier	6ER5/GG (6ES5) *

ITEM No.	USE	TYPE
V202	Mixer - Osc.	6CG8

* Alternate

FIXED CAPACITORS
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C204	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C205	30	#22-3111						
C206	28		NPO-DI 25	TCZ-27	C10Q27C	CCD-220	CNO-427	10TCU-Q27
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	1. 8-7	#22-3191		829-7				
C209	100 5%	#22-3192						
C210	. 5-3. 5	#22-3190						
C211	33 10%		NPO-DI 33	DD-330	L10Q33	CCD-330	CNO-433	10TCC-Q33
C212	. 5-3. 5	#22-3190						
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	18 N220 10%	#22-3025						10TCR-Q18
C215	7. 25 N150	#22-3026						10TCP-V82
C216	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	

Zenith Part Number.

RESISTORS
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	120K	
R202	1000Ω	

ITEM No.	RATING	REMARKS
R203	2700Ω	
R204	220K	

ITEM No.	RATING	REMARKS
R205	4700Ω	
R206	4700Ω	

COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L201	Ant. Trans.	†	
L202	RF Choke	20-762 †	
L203	RF Choke	20-763 †	
L204	RF Choke	20-762 †	
L205	Ant., RF, Mixer Grid & Osc. Coils	174-22	Channel 2
L206	"	174-23	Channel 3
L207	"	174-24	Channel 4
L208	"	174-25	Channel 5
L209	"	174-26	Channel 6
L210	"	174-27	Channel 7

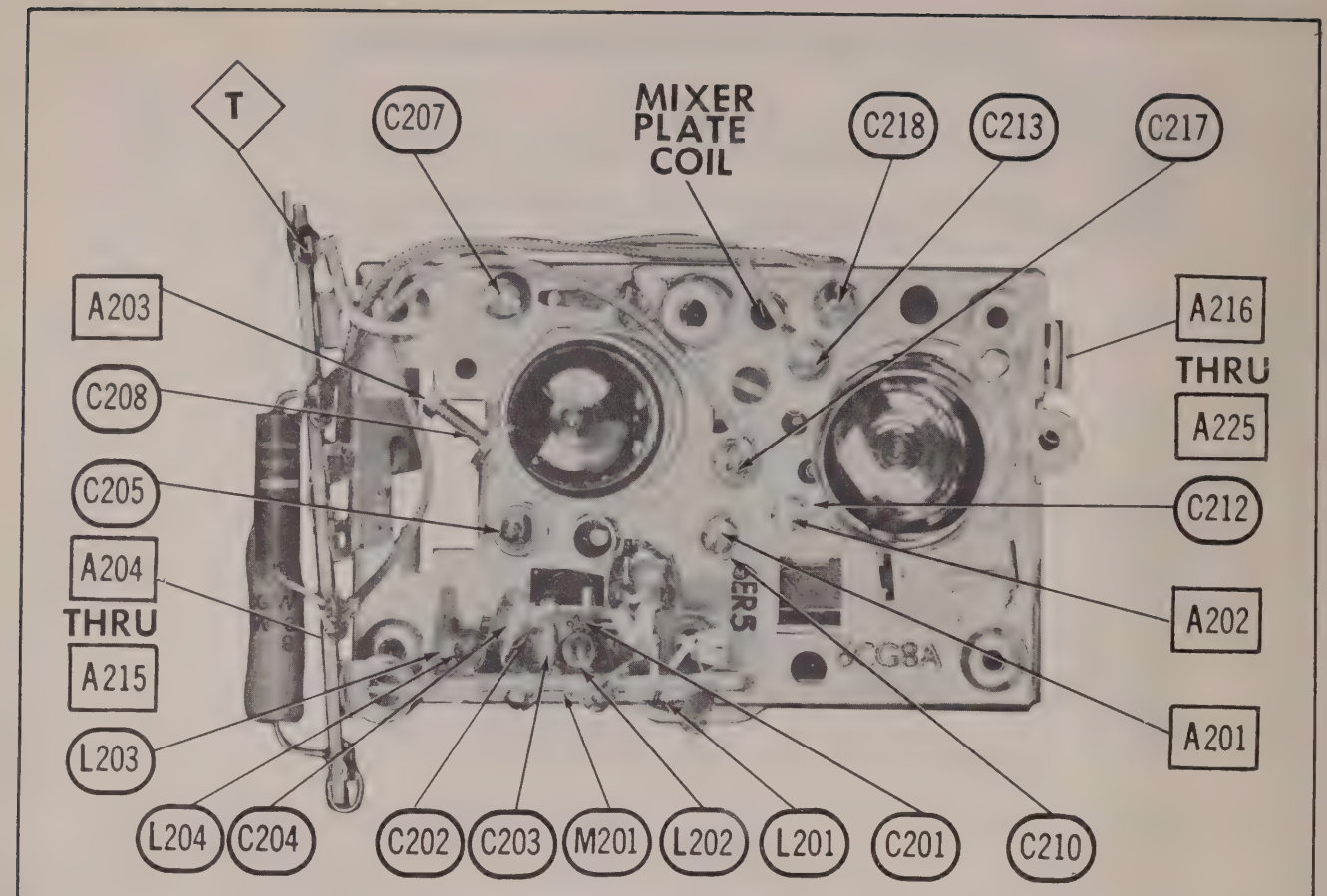
ITEM No.	USE	ZENITH PART No.	NOTES
L211	Ant., RF, Mixer Grid & Osc. Coils	174-28	Channel 8
L212	"	174-29	Channel 9
L213	"	174-30	Channel 10
L214	"	174-31	Channel 11
L215	"	174-32	Channel 12
L216	"	174-33	Channel 13
L217	RF Choke	20-758	
L218	Fine Tuning Coil	S-47481	Includes Assy.
L219	Mixer Plate Coil	S-47370 ①	

† Part of M201 Part #S-47681.

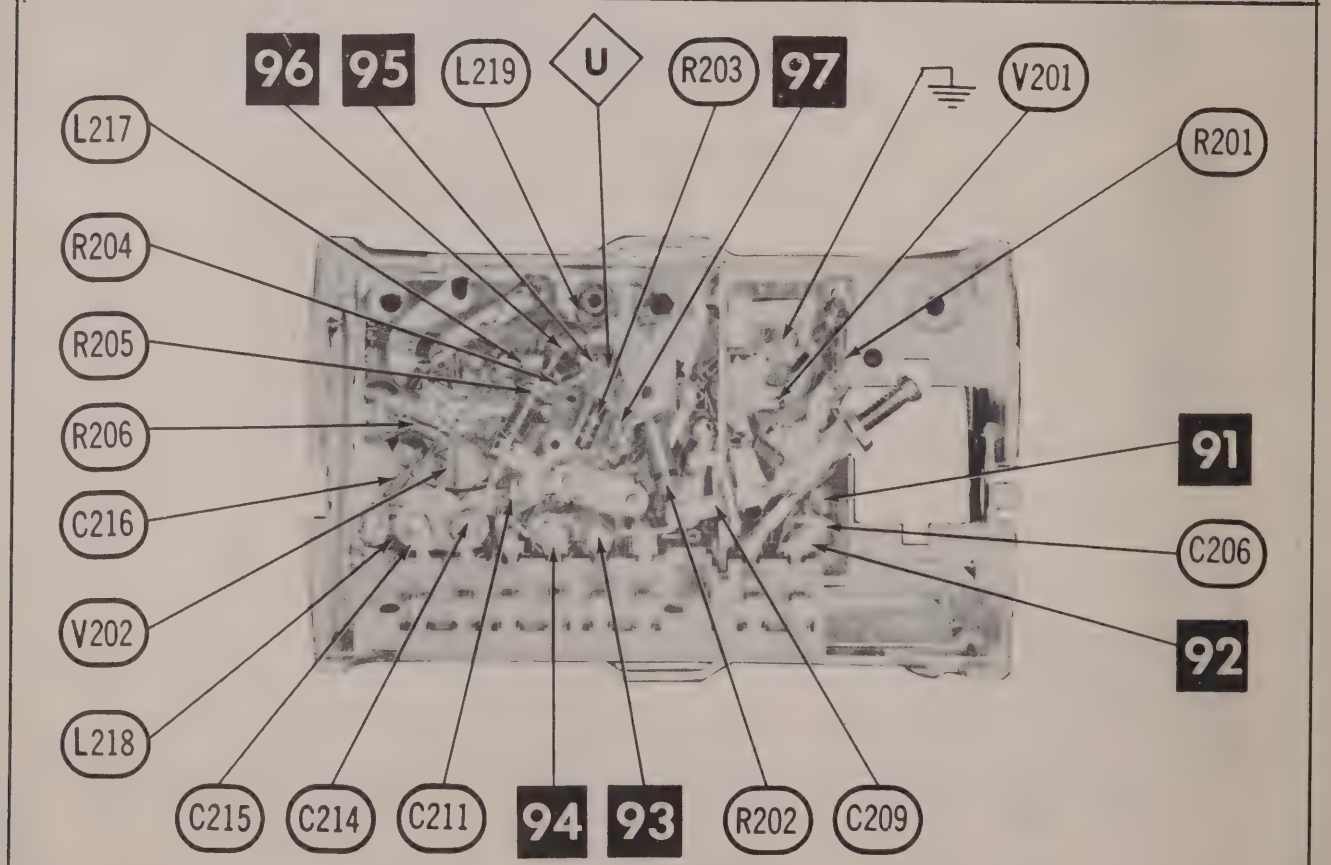
① Alternate Part #S-47854.

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M201	Antenna Input Assy.	S-47581	Includes L201, L202, L203, L204, C201, C202, C203, C204
	Drum Assembly	S-47856	Includes Shaft
	Detent Spring	80-1334	
	Detent Ball	184-23	
	Fine Tuning Shaft & Cam	S-47855	



TUNER 175-140 TOP VIEW



TUNER 175-140
BOTTOM VIEW

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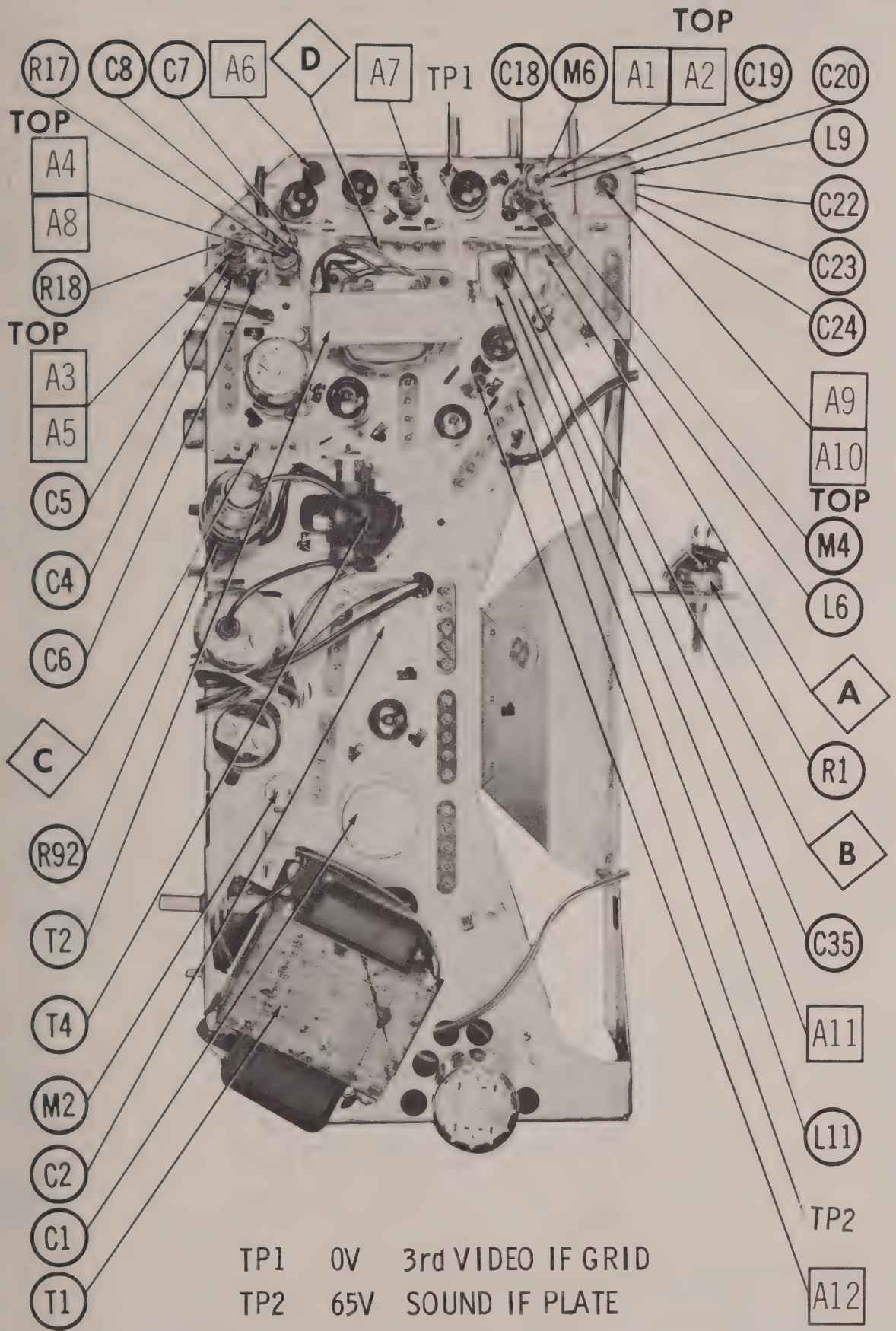
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



TP1 0V 3rd VIDEO IF GRID
TP2 65V SOUND IF PLATE

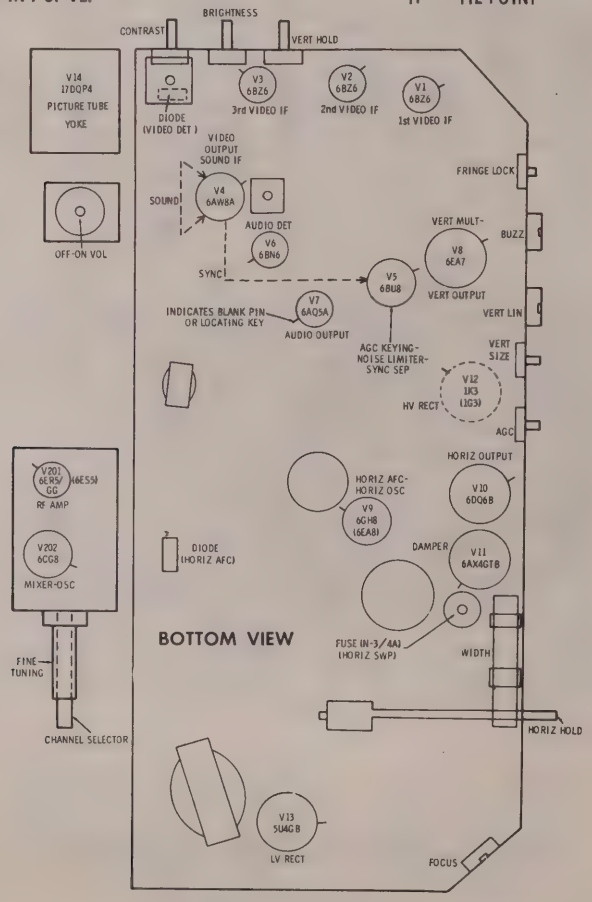
CHASSIS - TOP VIEW

RESISTANCE MEASUREMENTS

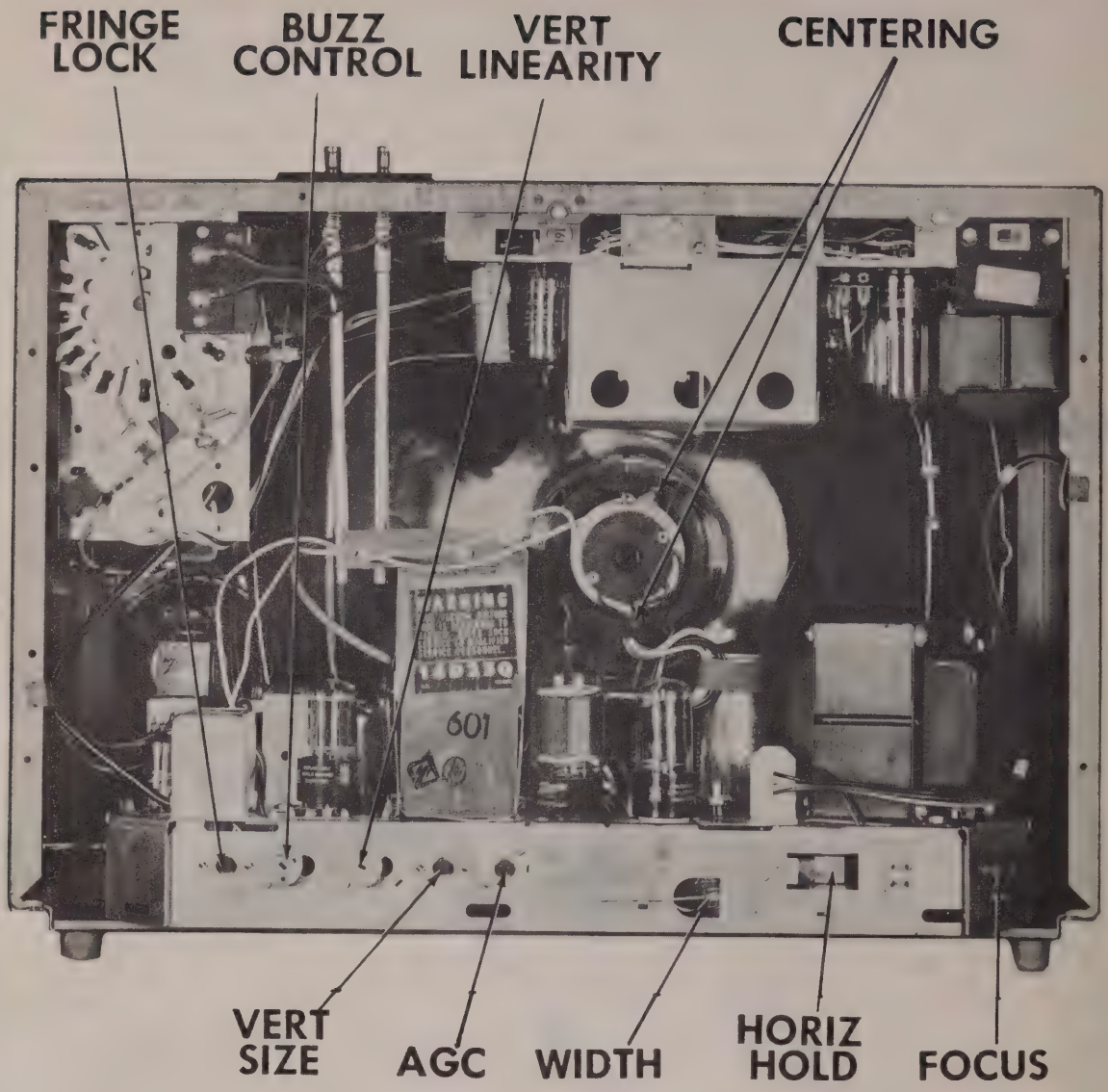
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	1.5meg	1500Ω	.1Ω	0Ω	▲ 500Ω	▲ 500Ω	1500Ω		
V2	6BZ6	35K	▲ 27Ω	.1Ω	0Ω	†470Ω	†470Ω	INF		
V3	6BZ6	.1Ω	120Ω	0Ω	.1Ω	†5600Ω	†5600Ω	0Ω		
V4	6AW8A	0Ω	100K	†37K	.1Ω	0Ω	47Ω	2700Ω	†33K	†8500Ω
V5	6BU8	0Ω	†15K	700K	.1Ω	0Ω	● 550K	●†600K	†35K	†8.2meg
V6	6BN6	●320Ω	.8Ω	0Ω	.1Ω	†27K	3.7Ω	†390K		
V7	6AQ5A	0Ω	680Ω	0Ω	.1Ω	† 1600Ω	† 1000Ω	0Ω		
V8	6EA7	1.3meg	†355Ω	● 700Ω	●430K	● †5meg	0Ω	0Ω	.1Ω	
V9	6GH8	†100K	100K	†47K	.1Ω	0Ω	†100K	98Ω	0Ω	1.8meg
V10	6DQ6B	TP	.1Ω	NC	†7600Ω	1meg	TP	0Ω	18Ω	TOP CAP †14Ω
V11	6AX4GTB	TP	TP	¶3meg	NC	†0Ω	TP	.1Ω	0Ω	
V12	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †195Ω
V13	5U4GB	NC	¶	TP	18Ω	NC	19Ω	TP	¶	
V14	17DQP4	NC	● 200K	.1Ω	0Ω	0Ω	† 2.5meg	†60K		
V201	6ER5/GG	0Ω	3meg	.1Ω	0Ω	†4900Ω	0Ω	0Ω		
V202	6CG8	4700Ω	†14K	0Ω	0Ω	.1Ω	†3900Ω	†9500Ω	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 275V SOURCE.
‡ MEASURED FROM PIN 3 OF V11.
▲ MEASURED FROM PIN 7 OF V2.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

The Horizontal Hold is equipped with a stop which limits rotation to approximately 270 degrees with the knob on the shaft. To adjust, remove the knob and adjust by turning the shaft until the picture is synchronized to the point where it is virtually impossible to disrupt horizontal synchronization when switching from channel to channel. Install the knob with its pointer centered between the stops.

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PRODUCTION CHANGE BULLETIN 230

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5 IN SET 416

Ekotape Models 270, 280 Series were covered in PHOTOFACT Folder 5 - Set 416.

Models 320, 320ST, 321 are electrically and mechanically the same except for the following changes.

COMPONENT CHANGE

The power on-off switch that is activated by the speed control knob (3) was previously part of the tone control (R2) (see power on-off switch (54A) and switch cam assembly (54) in this bulletin). The change in location of the on-off switch eliminates the off position on the escutcheon (5) near the tone control.

COMPONENTS ADDED

A neon warning light (which shows only when you are in record position) and a 240K ½ watt resistor which is in series with the neon light is added from the junction of C2 and pin 1 of L1 to ground. A partial schematic showing the record neon warning light is given in this bulletin.

TAPE-OFF SWITCH

The tape-off switch physical construction is changed. The new switch assembly (46) requires a new guide post. The metal guide post (46A) is used as both a left-hand tape guide and also is used as a retainer for the spring loaded arm, when the arm moves to the open position. With this type of tape-off switch assembly, the left-hand top tape guide (58), spacer (59), and shelf (60) are omitted.

A top view of the tape transport mechanism (with top panel (14) and bracket (17) removed) is given below in this bulletin.

EKOTAPE MODELS 320, 320ST, 321

PRODUCTION CHANGE
BULLETIN 230

PRODUCTION CHANGE
BULLETIN 230

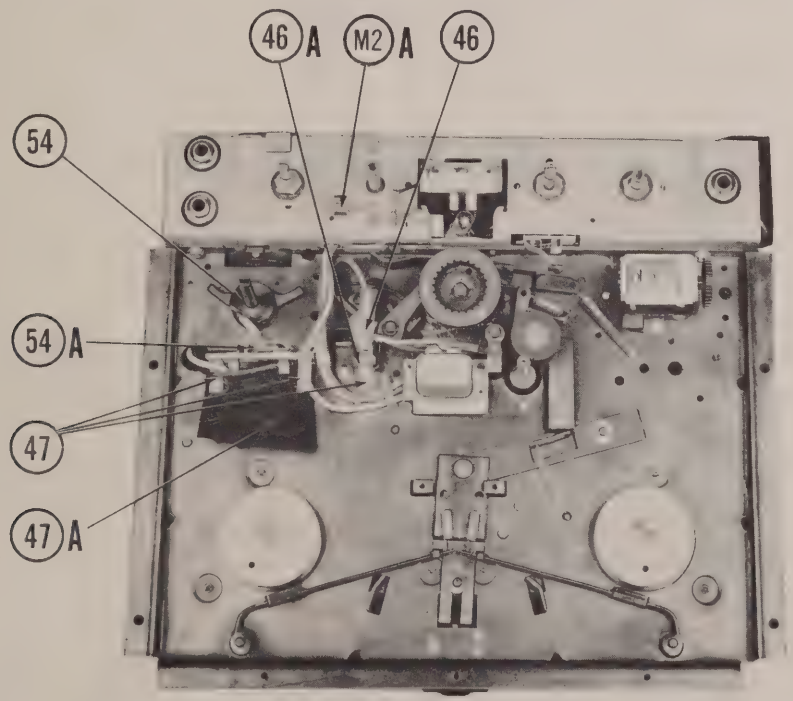


Fig. 1. Top View of Tape Transport Mechanism With Top Panel (14) & Bracket (17) Removed

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	TO RECORD To switch to record position the record-listen knob (3) must be depressed and turned simultaneously. This method of operation changed the construction of the record-listen knob (3). An exploded view of the record-listen knob (3) is given in this bulletin.
MODEL 320, ST	POWER REQUIREMENTS The power required is 117 volts AC, 60 cycle, 115 watts, 1.18 amperes.
MODEL 321	POWER REQUIREMENTS The power required is 115/320 volts AC, 50 cycle, 115 watts, 1.18/.59 amperes. A partial schematic of Model 321 power supply is given in this bulletin.

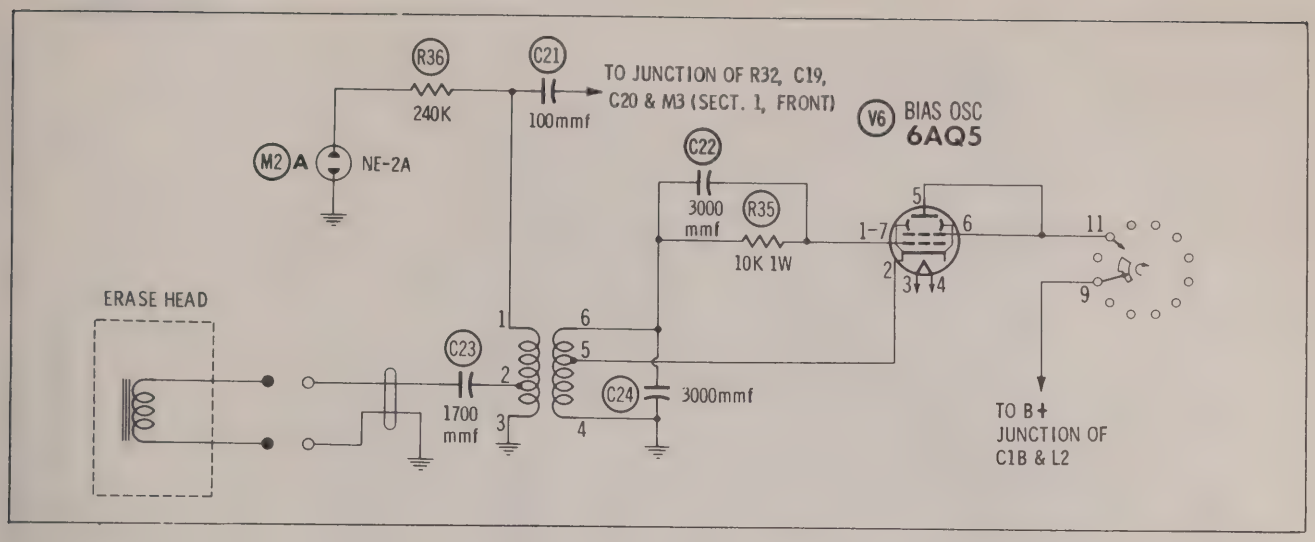


Fig. 2. Bias Osc. Partial Circuit

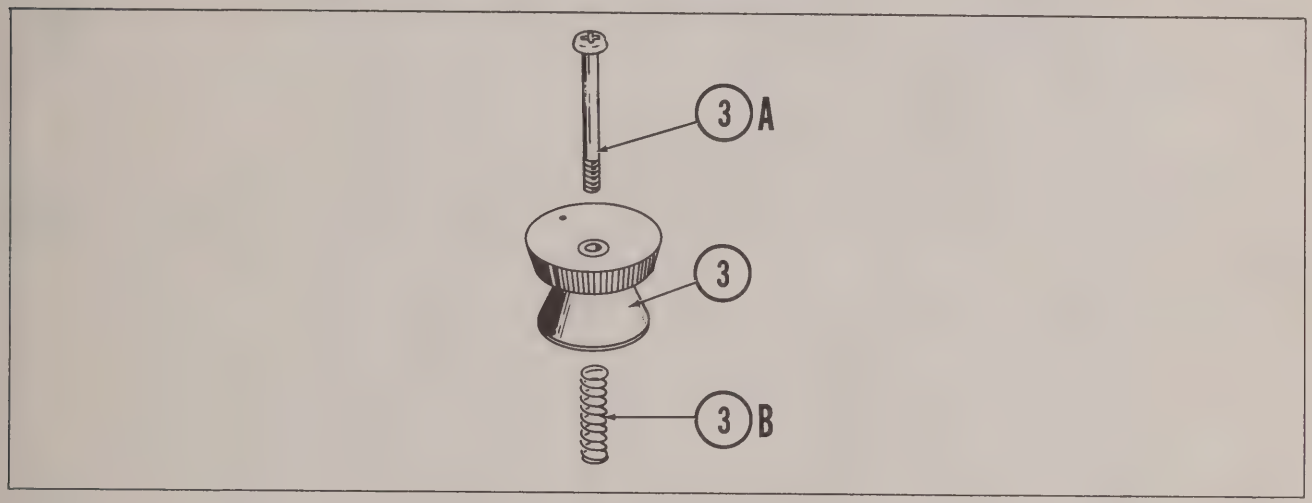


Fig. 3 Record-Listen Knob Exploded View

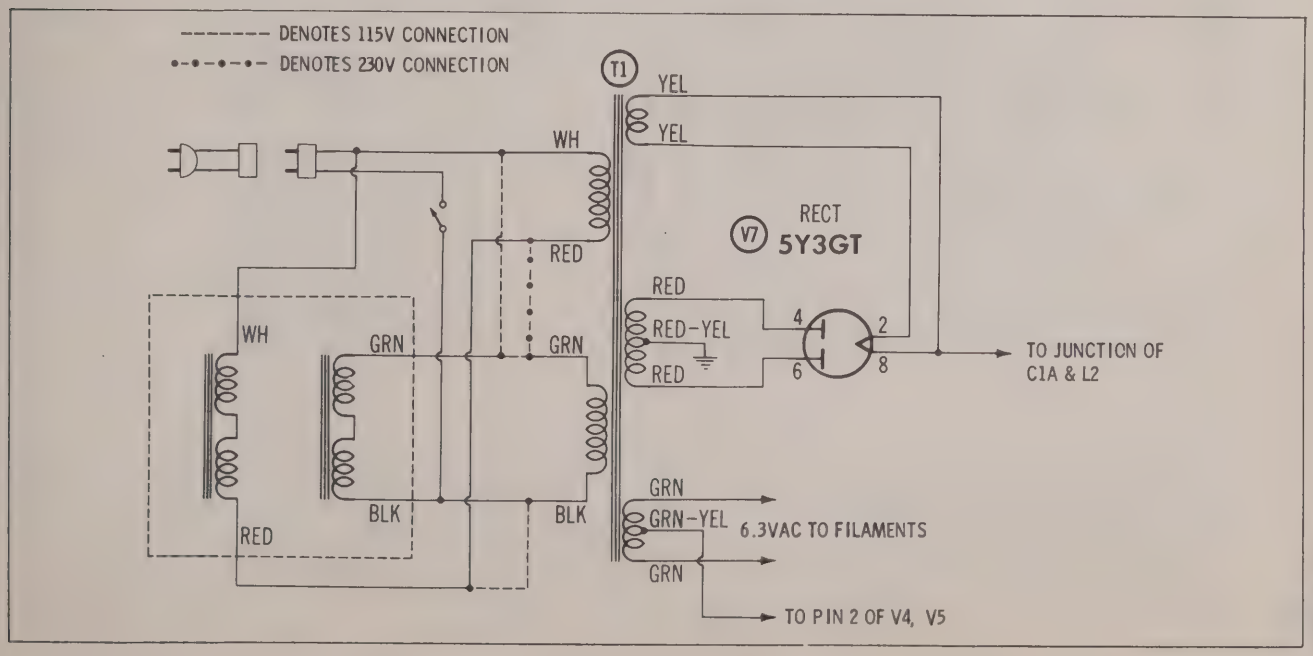


Fig. 4. Model 321 Power Supply Partial Circuit

MECHANICAL PARTS LIST SUPPLEMENT

Parts Added

Ref. No.	Part No.	Description
3	242-25257	Knob Assembly
3A	241-25260	Screw
3B	241-25259	Spring
5	241-20433-4	Cover Plastic
14	241-17814-9	Top Panel
46	242-24018	Switch & Bracket Ass'y.
46A	241-25317	Tape Guide Post & Switch Retainer
47	241-18841	Pan Hd. Sems Fastener, #4-40 x 3/16" (3 Req'd); 2 for #241-25269 and 1 for #241-25317.
47A	241-13288-7	Insulation Strip
54	242-25262	Switch Cam Ass'y.
54A	241-25269	Power On-Off Switch & Bracket Ass'y.
76	242-17683-15	Mech. Plate Ass'y.
137	241-25264	Motor

Parts Deleted

Ref. No.	Part No.	Description
3	242-24066	Knob Assembly
4	241-15116	Set Screw, Knob
5	241-20433-3	Cover Plastic
14	241-17814-7	Top Panel
46	242-24018	Switch & Bracket Ass'y.
54	242-17728	Switch Cam Ass'y.
57	29527-13	#4-40 x 1/2" Rd. Hd. Machine Screw
58	241-17754	Top, Tape Guide (Left-Hand)
59	241-17753	Spacer, Tape Guide (Left-Hand)
60	241-17752	Shelf, Tape Guide (Left-Hand)
76	242-17683-9	Mech. Plate Ass'y.
137	241-20800	Motor

ELECTRICAL PARTS LIST SUPPLEMENT

Parts Added

Ref. No.	Part No.	Description
R2	241-25267	Tone Control — 250K, 100K
R30	211-22994	Resistor, 250Ω, 5 Watts
R36	29501-48	Resistor, 240K, 1/2 Watt
SP1	241-25254	Speaker (8Ω, 6" x 9" Oval)
M2A	241-25270	Neon Light (NE2A)
M8A	241-25269	Switch, Power On-Off

Parts Deleted

Ref. No.	Part No.	Description
R30	29501-90	Resistor, 240Ω, 2 Watts
R2	241-17941-1	Power On-Off Switch Deleted From Tone Control
SP1	241-22482	Speaker (8Ω Woofer, 6" x 9" Oval)

PHOTOFACT* Folder

AIRLINE MODELS
WG-2683A, WG-2684A

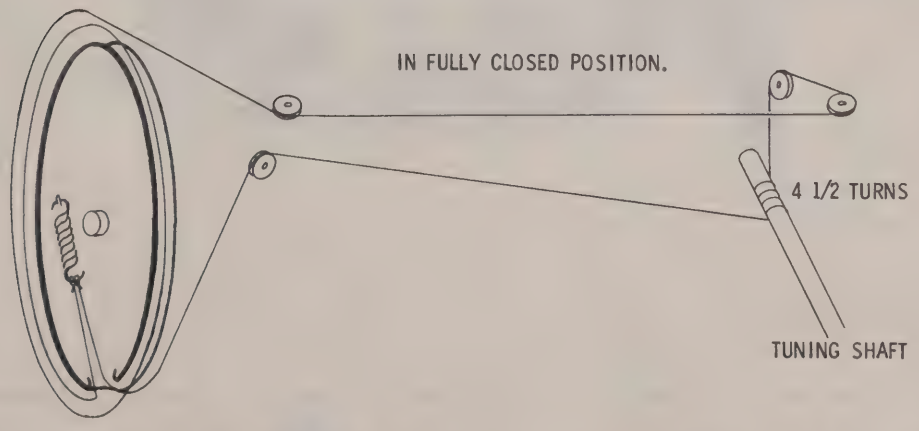
MODEL WG-2684A

AIRLINE MODELS
WG-2683A, WG-2684A

TRADE NAME	Airline Models WG-2683A, WG-2684A		
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois		
TYPE SET	AC Operated 9 Tube FM-AM Tuner, 2 Tube Stereo Preamp., 8 Tube Stereo Amp. And 4 Speed Automatic Record Changer		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	170 Watts, 1.6 Amp. @117 Volts AC (Less Phono)
TUNING RANGE—BROADCAST	535 - 1620KC	FREQ. MOD.	88 — 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #28A232 — SEE SIMILAR V-M 1200A — PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING



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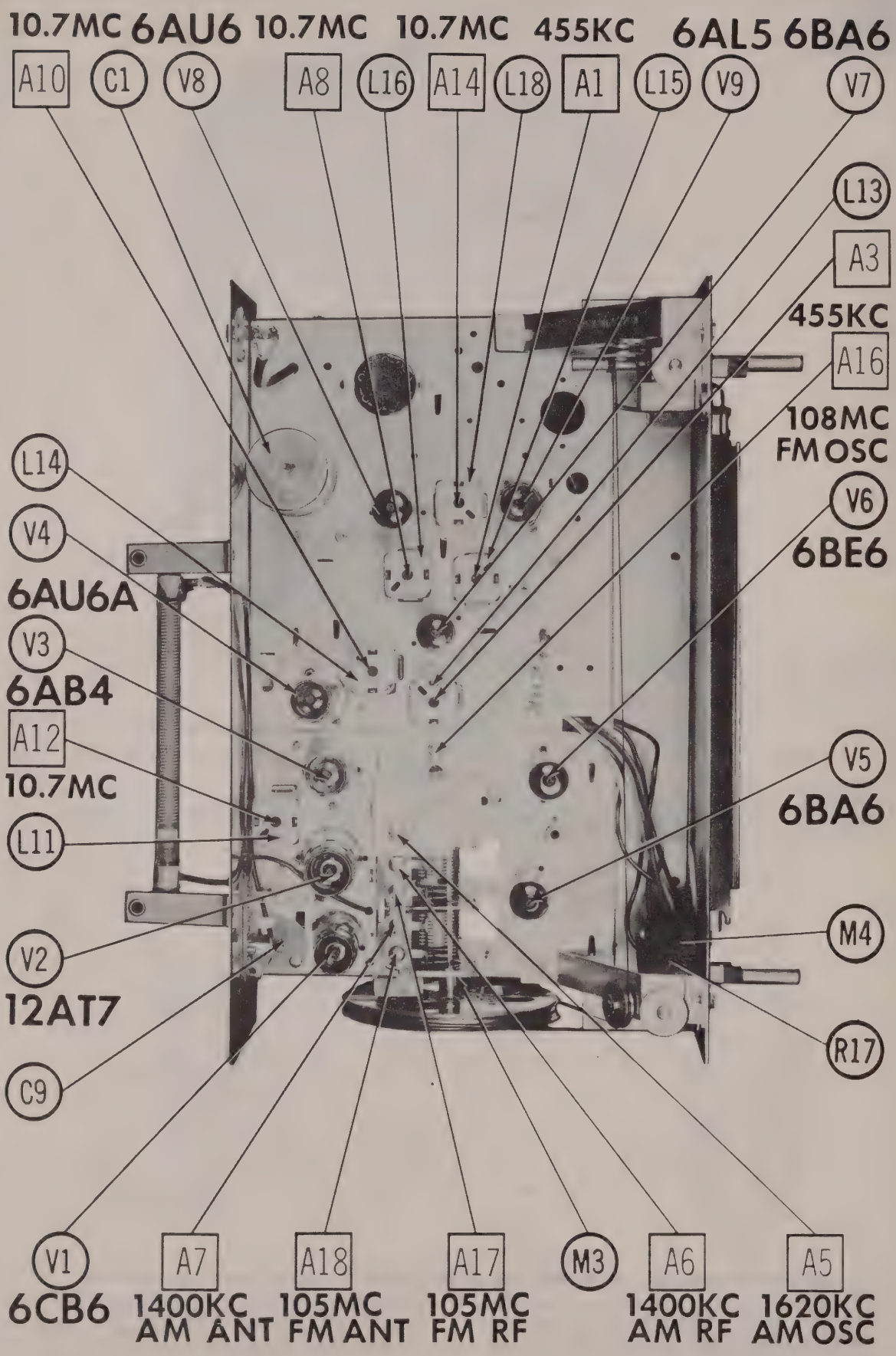
JN409

SET 466 FOLDER 4



TUNER CHASSIS — TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested alignment tools: A1 thru A4 and A8 thru A15..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A5, A6, A7, A16, A17, A18..... GENERAL CEMENT #5097, 8727
WALSCO #2515

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across output jack	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	"	A5	"
3.	"	High side to pin 1 (grid) of AM RF Amp. Low side to chassis.	1400KC	"	1400KC	"	A6	"
4.	100mmf Ceramic Capacitor	High side to AM antenna terminal. Low side to chassis.	1400KC	"	1400KC	"	A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.005mfd	High side to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
6.	"	High side to pin 1 (grid) of FM Limiter. Low side to chassis.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A14	"
7.	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.005mfd	High side to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. amp. thru 100K to point Ⓐ. Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	High side to pin 1 (grid) of FM Limiter. Low side to chassis.	"	"	"	Vert. amp. thru 100K to point Ⓑ Low side to chassis.	A14	"
7.	"	"	"	"	"	Vert. amp. thru 100K to point Ⓒ. Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Two 150Ω Carbon Resistor	Across FM antenna terminals with 150Ω in each lead.	108MC (Unmod.)	FM	108MC	DC probe to point Ⓐ. Common to chassis.	A16	Adjust for maximum deflection.
9.	"	"	105MC	"	105MC	"	A17, A18	Adjust for maximum deflection while rocking tuning gang.

FIG. 1

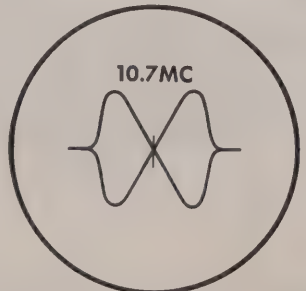
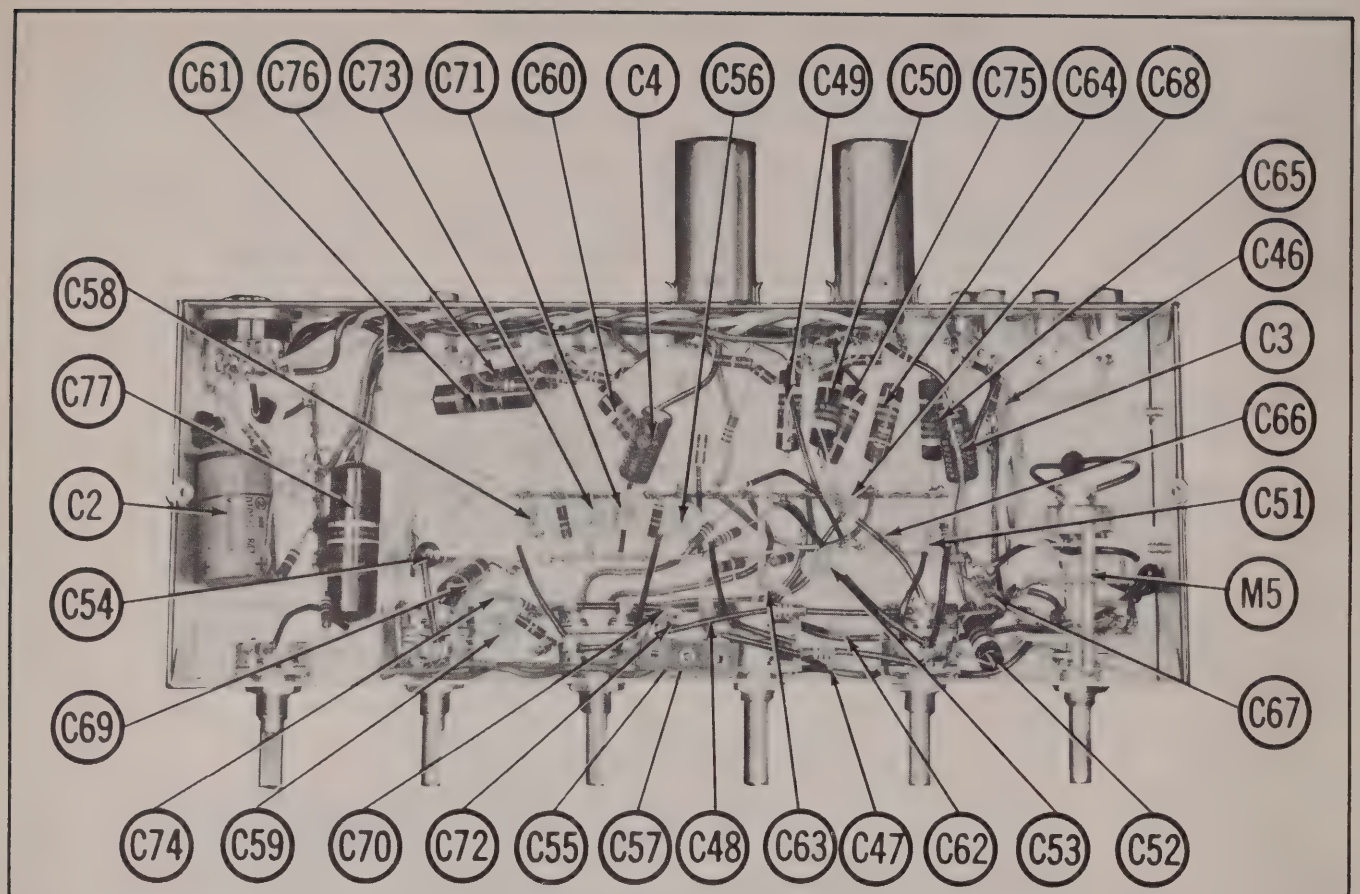
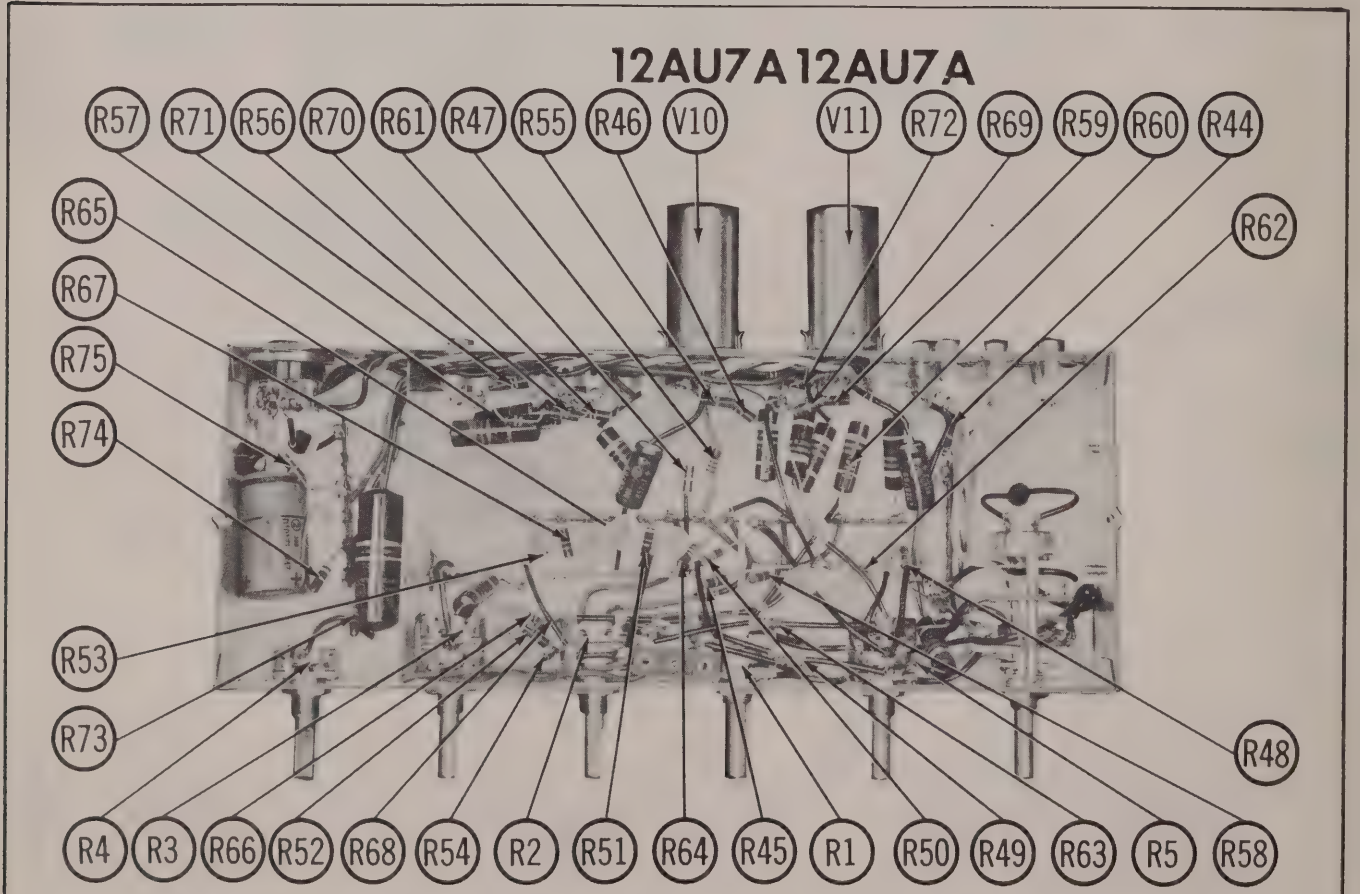


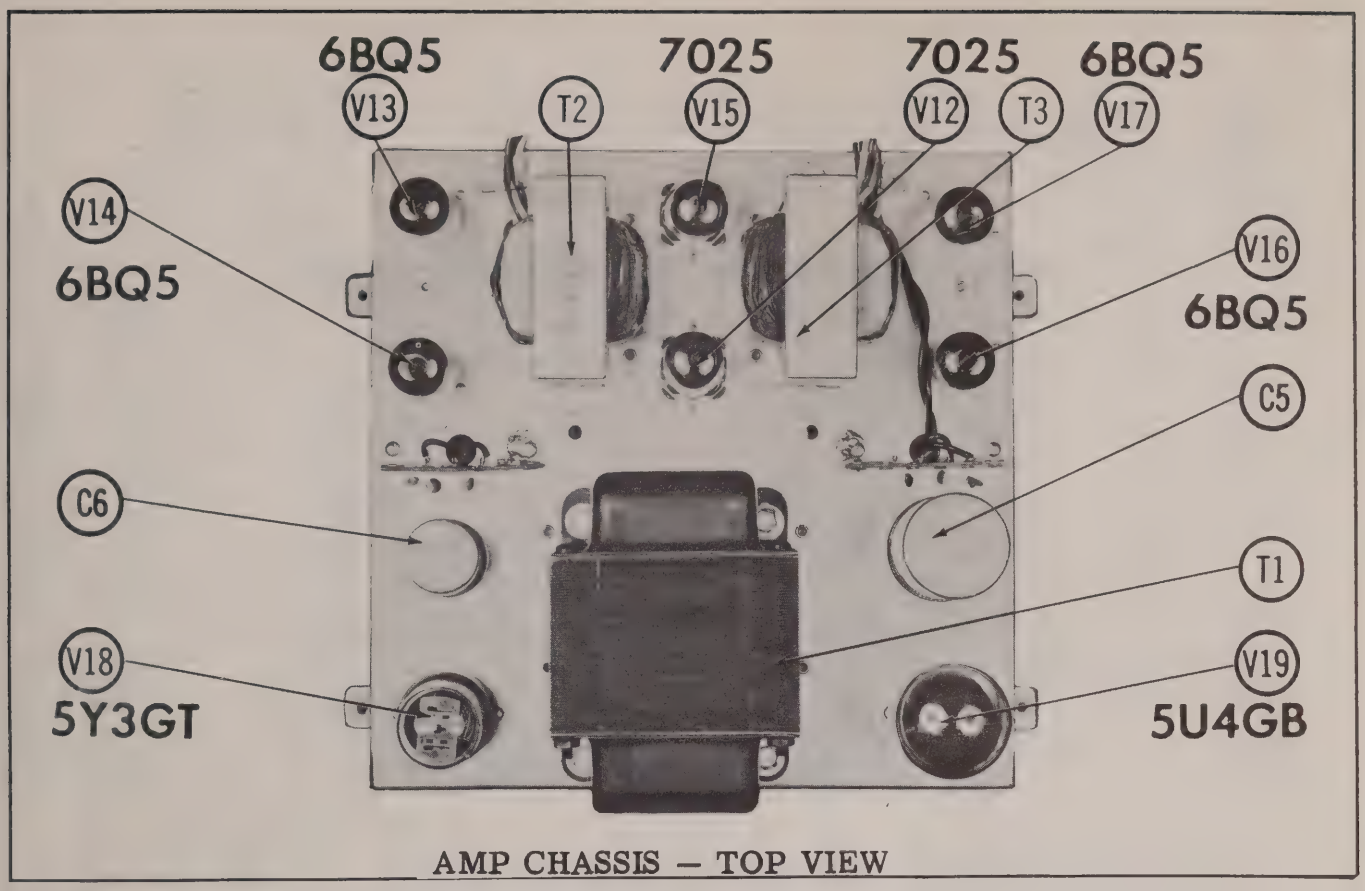
FIG. 2



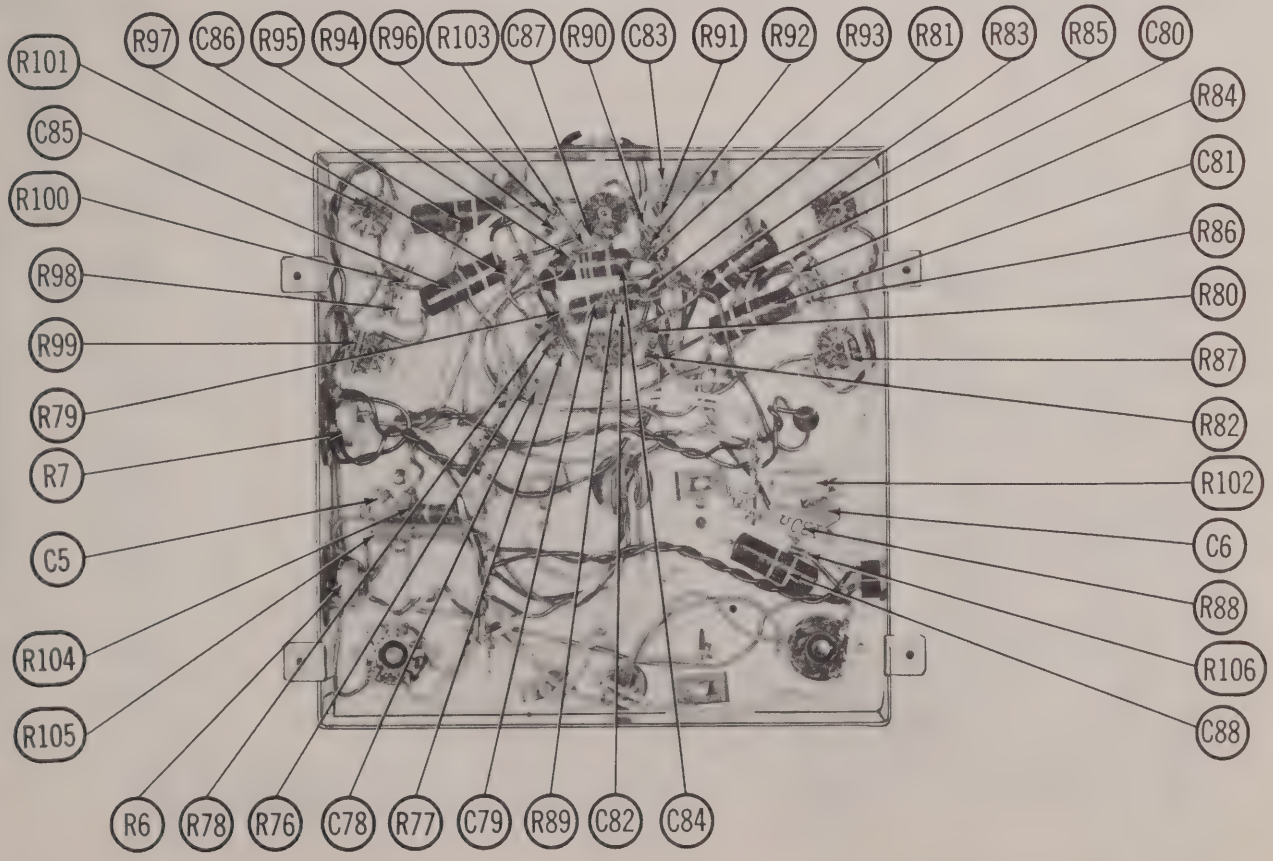
PREAMP. CHASSIS BOTTOM VIEW — CAPACITOR & MISC. IDENT.



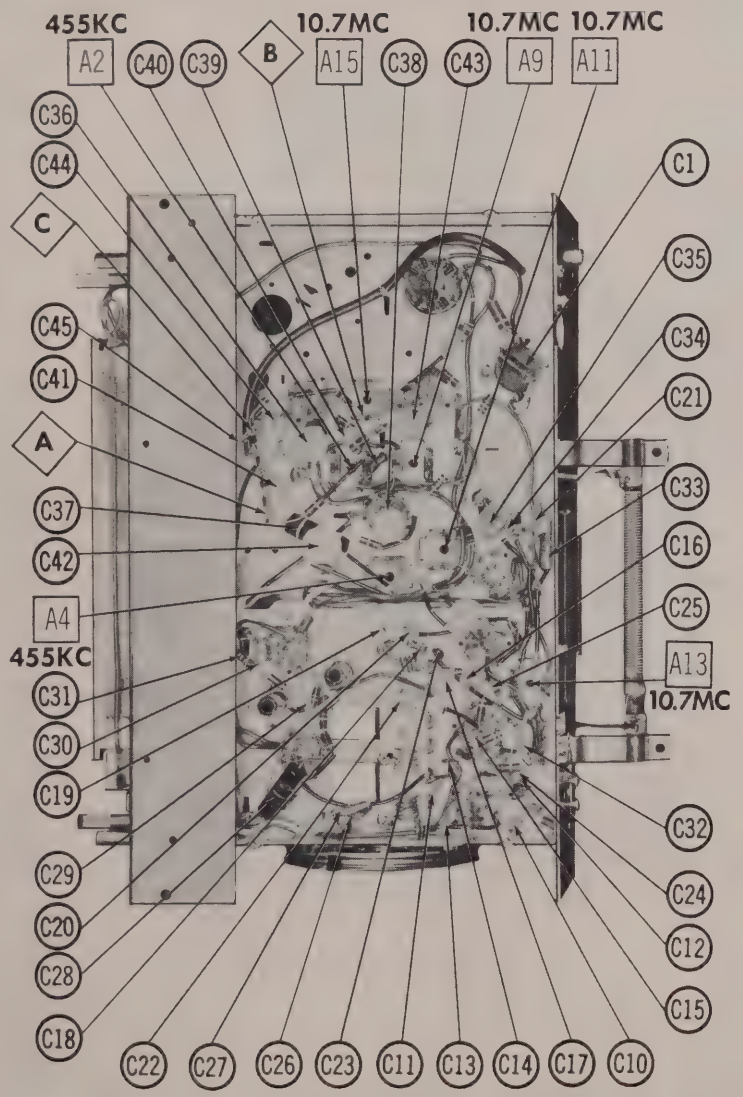
PREAMP. CHASSIS BOTTOM VIEW — RESISTOR & TUBE IDENT.



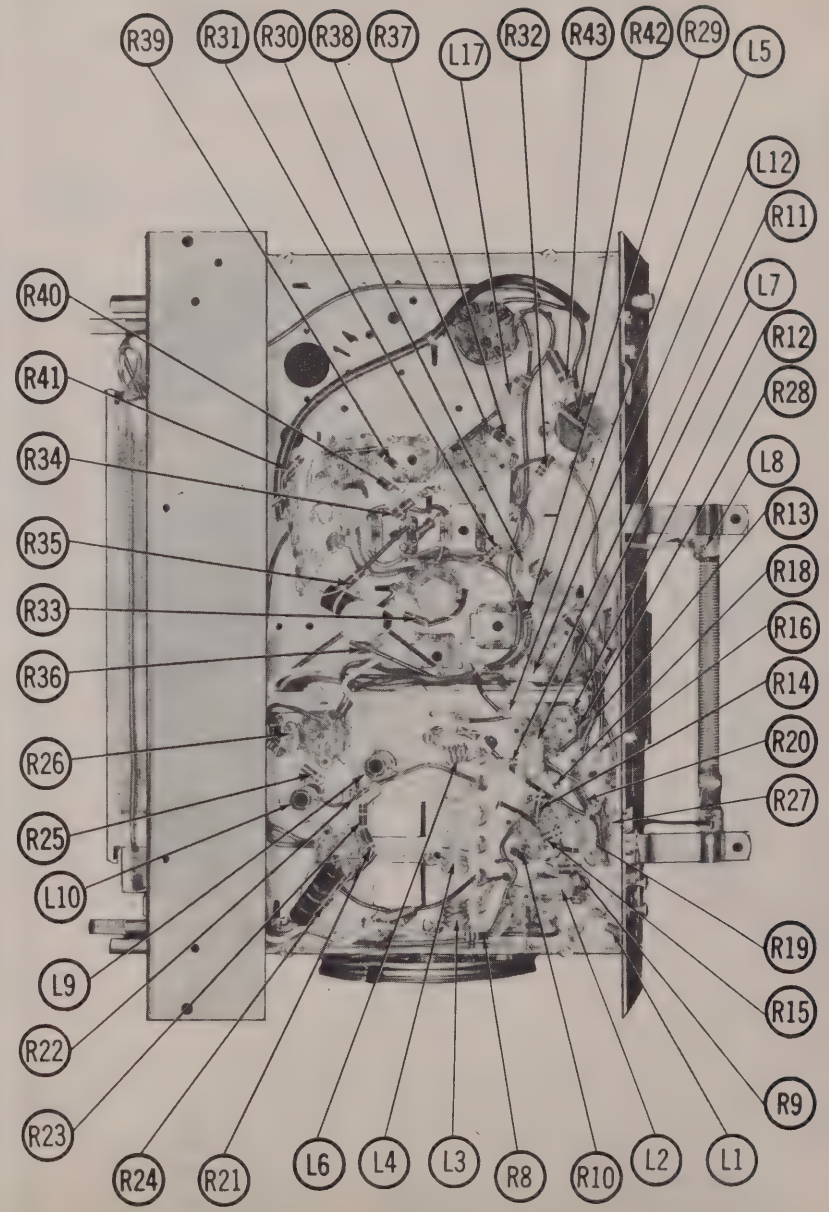
AMP CHASSIS – TOP VIEW



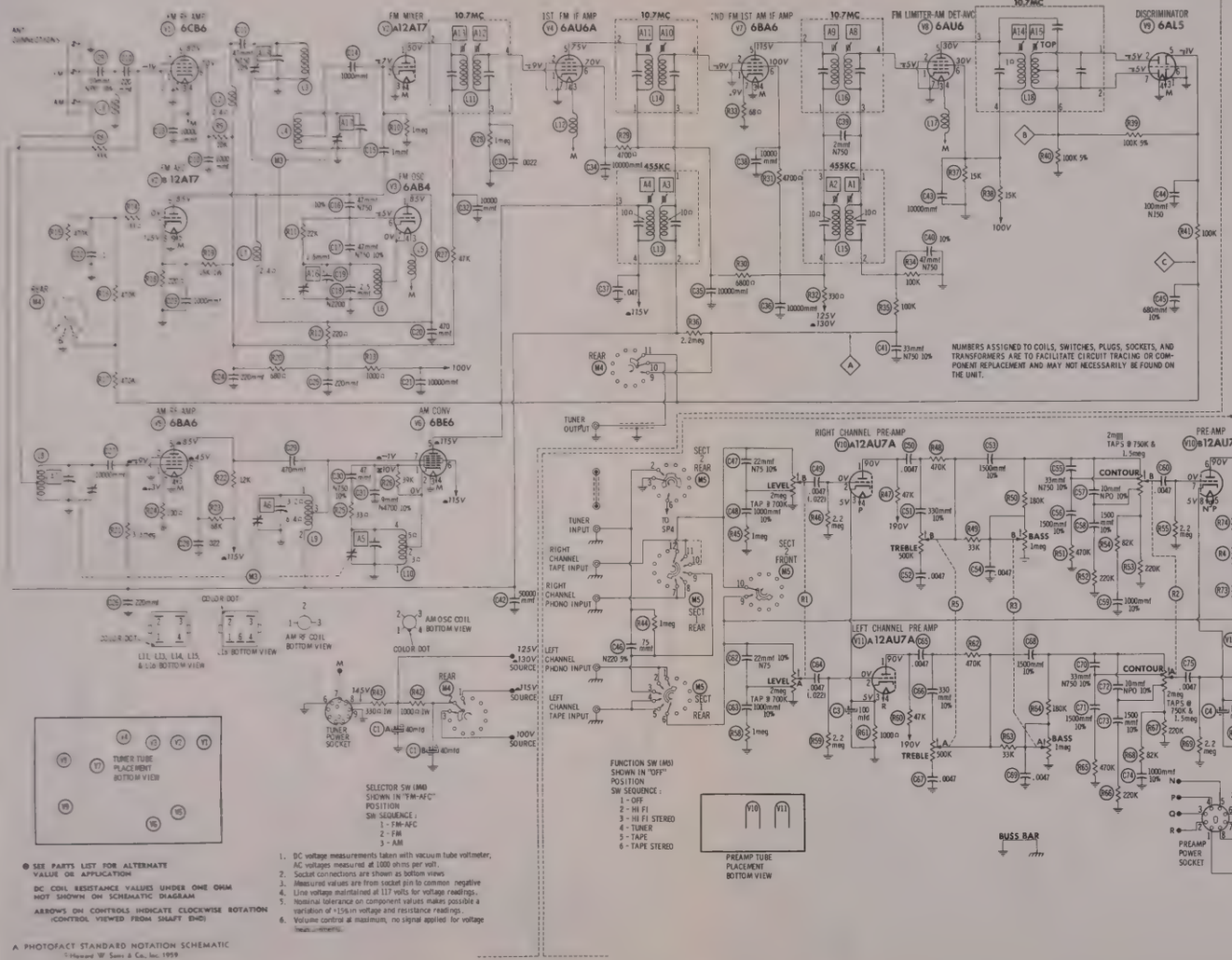
AMP CHASSIS – BOTTOM VIEW



TUNER CHASSIS BOTTOM VIEW



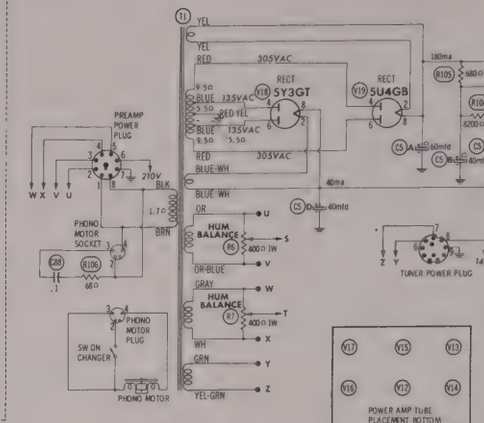
TUNER CHASSIS — BOTTOM VIEW

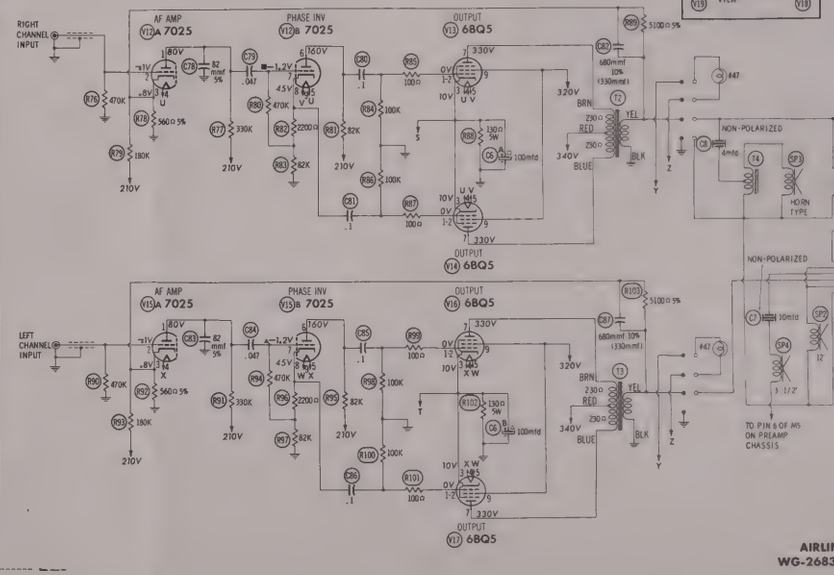

FM MIXER V2 12AT7
10.7MC
1ST FM IF AMP V4 6AU6A
2ND FM 1ST AM IF AMP V7 6BA6
FM LIMITER-AM DET-AVC V8 6AU6
DISCRIMINATOR V9 6AL5
FM R-F AMP V1 6CB6
FM OSC V3 12AT7
FM OSC V3 6AB4
455KC
AM R-F AMP V5 6BA6
AM CONV V6 6BE6
TUNER OUTPUT
REAR
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
RIGHT CHANNEL PRE-AMP V10A 12AU7A
PRE-AMP V10B 12AU7A
LEFT CHANNEL PRE-AMP V11A 12AU7A
PRE-AMP V11B 12AU7A
CONTOUR
LEVEL
BASS
TREBLE
BALANCE
TAPE OUTPUT
RIGHT CHANNEL OUTPUT
LEFT CHANNEL OUTPUT
TUNER INPUT
RIGHT CHANNEL TAPE INPUT
RIGHT CHANNEL PHONO INPUT
LEFT CHANNEL PHONO INPUT
LEFT CHANNEL TAPE INPUT
TO SP4
SECT FRONT
SECT REAR
AM OSC COIL BOTTOM VIEW
L11, L12, L14, L15 & L16 BOTTOM VIEW
L13 BOTTOM VIEW
AM RF COIL BOTTOM VIEW
COLOR DOT
TUNER POWER SOCKET
125V 130V SOURCE
115V SOURCE
100V SOURCE
TUNER TUBE PLACEMENT BOTTOM VIEW
FUNCTION SW (M5) SHOWN IN "OFF" POSITION
SW SEQUENCE :
1 - OFF
2 - HI FI
3 - HI FI STEREO
4 - TUNER
5 - TAPE
6 - TAPE STEREO
PREAMP TUBE PLACEMENT BOTTOM VIEW
BUSS BAR
PREAMP POWER SOCKET
SELECTOR SW (M4) SHOWN IN "FM-AFC" POSITION
SW SEQUENCE :
1 - FM-AFC
2 - FM
3 - AM
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1959
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum; no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	2.4meg	0Ω	0Ω	.1Ω	†3000Ω	†13K	0Ω		
V2	12AT7	†50K	1meg	0Ω	.1Ω	.1Ω	†2500Ω	▪ 700K 400K	220Ω	0Ω
V3	6AB4	†2500Ω	NC	.7Ω	0Ω	TP	22K	0Ω		
V4	6AU6A	1meg	0Ω	.5Ω	0Ω	†7500Ω	††1K	0Ω		
V5	6BA6	▲ 5.7meg	▲ 0Ω	.1Ω	0Ω	†▲13K	†▲69K	▲ 100Ω		
V6	6BE6	▲ 39K	▲ 3Ω	0Ω	.1Ω	†▲1300Ω	†▲1300Ω	▲ 2.4meg		
V7	6BA6	2.4meg	0Ω	0Ω	.1Ω	†660Ω	†500Ω	68Ω		
V8	6AU6	100K	0Ω	0Ω	.1Ω	†12K	†12K	0Ω		
V9	6AL5	0Ω	100K	.1Ω	0Ω	150K	0Ω	100K		
V10	12AU7A	†† 57K	2.2meg	1000Ω	Z30Ω	Z30Ω	†† 45K	2.2meg	1000Ω	Z30Ω
V11	12AU7A	†† 57K	2.2meg	1000Ω	Z30Ω	Z30Ω	†† 45K	2.2meg	1000Ω	Z30Ω
V12	7025	†† 340K	470K	560Ω	Z30Ω	Z30Ω	†† 90K	550K	84K	Z30Ω
V13	6BQ5	100K	100K	130Ω	Z30Ω	Z30Ω	NC	†† Z30Ω	NC	†† 680Ω
V14	6BQ5	100K	100K	130Ω	Z30Ω	Z30Ω	NC	†† Z30Ω	NC	†† 680Ω
V15	7025	†† 340K	470K	560Ω	Z30Ω	Z30Ω	†† 90K	550K	84K	Z30K
V16	6BQ5	100K	100K	130Ω	Z30Ω	Z30Ω	NC	†† Z30Ω	NC	†† 680Ω
V17	6BQ5	100K	100K	130Ω	Z30Ω	Z30Ω	NC	†† Z30Ω	NC	†† 680Ω
V18	5Y3GT	NC	¶	NC	5.5Ω	NC	5.5Ω	NC	¶	
V19	5U4GB	NC	¶	NC	15Ω	NC	15Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM PIN 8 OF V12.
†† MEASURED FROM PIN 8 OF V19.
▪ MEASURED FROM PIN 8 OF V12.
▪ MEASURED FROM PIN 8 OF V15.
NC NO CONNECTION
▲ MEASURED IN "FM-AFC" POSITION.
▲ MEASURED IN "AM" POSITION.





AIRLINE MODELS WG-2683A, WG-2684A

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amplifier	6CB6	V11	Left Channel Preamp.	12AU7A (ECC82)
V2	FM Mixer-AFC	12AT7	V12	Right Channel AF Amp. - Right Channel Phase Inv.	7025
V3	FM Osc.	6AB4			
V4	1st FM IF Amp.	6AU6A	V13	Right Channel Output	6BQ5 (EL84)
V5	AM RF Amplifier	6BA6	V14	Right Channel Output	6BQ5 (EL84)
V6	AM Converter	6BE6	V15	Left Channel AF Amp. - Left Channel Phase Inv.	7025
V7	2nd FM IF Amp. - 1st AM IF Amp.	6BA6	V16	Left Channel Output	6BQ5 (EL84)
V8	FM Limiter - AM Det. - AVC	6AU6	V17	Left Channel Output	6BQ5 (EL84)
V9	Discriminator	6AL5	V18	Rectifier	5Y3GT
V10	Right Channel Preamp.	12AU7A (ECC82)	V19	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	200	45X454	AFH2-57	B0450	FP217.87	TMD-31	TVL-2575	
B	▲40	200							
C2	20	350	45X455	PRS450V20	BR2035	TC65	TD-20-350	TVA-1608	
C3	100	10	45X459	SRE12V100	NLW100-10	TT15X100	ML100-15	TE-1119.3	
C4	100	10	45X459	SRE12V100	NLW100-10	TT15X100	ML100-15	TE-1119.3	
C5A	▲60	400	45X450		C0350	FP377		TVLS-46711.1*	
B	■40	400			BR6045	TC795			
C	▲40	400							
D	40	200							
C6A	■100	25	45X457	AFH2-06-20	B0085	WP202.5	TMD-107	TVL-2326	
B	▲100	25							
C7	10	50	45X461	NP-PRS350VNP10	BBR20-150 †	TCN5010		TVAS-1304.1*	
C8	4	50	45X458	NP-PRS50VNP4	BBR8-150 †	TCN504		TVAS-1302.5*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use 2 units. Connect negatuve terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C9	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C10	220		BPD-00022	DD-221	L10T22	CCD-221	B-322	5GA-T22
C11	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C12	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D10
C15	1		NPO-SI 1.0	TCZ-1	C10V15C		CNO-510	10TCC-V10
C16	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C17	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C18	2.5 N2200	#47X635						
C19	1.5	#17A274		829-6				
C20	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	.1 100V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C23	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D10
C24	220		BPD-00022	DD-221	L10T22	CCD-221	B-322	5GA-T22
C25	220		BPD-00022	DD-221	L10T22	CCD-221	B-322	5GA-T22
C26	220		BPD-00022	DD-221	L10T22	CCD-221	B-322	5GA-T22
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	.022 200V		P288N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C29	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C30	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C31	9 N4700 10%	#47X632				*		
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	.0022 200V		P288N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C37	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C38	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C39	2 N750	#47X628						
C40	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CCN-447	10TCU-047
C41	33 N750 10%		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q47
C42	50000		BPD-05	DF-503	CUB2S5	6DP-3-503	TA-150	5HK-S50
C43	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	100 N150					*		
C45	680 10%		DI-680	D6-681	1R5T68	CCD-681	JL-368	MS-368
C46	75 N220 5%					*		
C47	22 N75 10%	#80X32						
C48	1000 10%		DI-1000		1R5D1	CCS-102	JL-210	MS-21
C49	.0047 400V	(.022) †	P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C50	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C51	330 10%		DI-330	D6-331	L10T33	CCD-331	JL-333	MS-333
C52	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C53	1500 10%		DI-1500		1R5D15	CCS-152	JL-215	MS-215
C54	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C55	33 N750 10%		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C56	1500 10%		DI-1500		1R5D15	CCS-152	JL-215	MS-215
C57	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C58	1500 10%		DI-1500		1R5D15	CCS-152	JL-215	MS-215
C59	1000 10%		DI-1000		1R5D1	CCS-102	JL-210	MS-21
C60	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C61	.022 400V	(.0047) †	P488N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C62	22 N75 10%	#80X32						
C63	1000 10%		DI-1000		1R5D1	CCS-102	JL-210	MS-21
C64	.0047 400V	(.022) †	P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C65	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C66	330 10%		DI-330	D6-331	L10T33	CCD-331	JL-333	MS-333
C67	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C68	1500 10%		DI-1500		1R5D15	CCS-152	JL-215	MS-215
C69	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C70	33 N750 10%		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C71	1500 10%		DI-1500		1R5D15	CCS-152	JL-215	MS-215
C72	10 NPO 10%		NPO-DI 10	DTZ-10	C10QIC	CCTO-100	CNO-410	10TCC-Q10
C73	1500 10%		DI-1500		1R5D15	CCS-152	JL-215	MS-215
C74	1000 10%		DI-1000		1R5D1	CCS-102	JL-210	MS-21
C75	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C76	.022 400V	(.0047) †	P488N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C77	.47 200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C78	82 5%		1469-000082	TCZ-82	22R5Q82	CM-20B-820J	CNO-482	MS-482
C79	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C80	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C81	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C82	680 10%	(330mmf) †	DI-680	D6-681	1R5T68	CCS-681	JL-368	MS-368
C83	82 5%		1469-000082	TCZ-82	22R5Q82	CM-20B-820J	CNO-482	MS-482
C84	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C85	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C86	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C87	680 10%	(330mmf) †	DI-680	D6-681	1R5T68	CCS-681	JL-368	MS-368
C88	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
\# Airline Part Number.
† Alternate Value.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg *	½	36X411				▲ UE4042	Level, Left Channel
B	2meg *	½						Level, Right Channel
R2A	2meg †	½	36X408				‡ UE4035	Contour, Left Channel
B	2meg †	½						Contour, Right Channel
R3A	1meg	½	40X458	B-70	AD47-1meg-Z	Q11-138		Bass, Left Channel
B	1meg	½		SR-70	Not Req.	M11-137	■ UE3913	Bass, Right Channel
C	Shaft			Not Req.	FS-3	Not Req.		
R4A	100K	½	40X459	B-40	A47-100K-S	Q11-128	U41	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	500K	½	40X457	B-60	AD47-500K-Z	Q11-133		Treble, Left Channel
B	500K	½		SR-60	Not Req.	M11-133	▲ UE1398	Treble, Right Channel
C	Shaft			Not Req.	FS-3	Not Req.		
R6A	400Ω	1(WW)	40X452	WN-401	A43-400	W11-202	R500L	Hum Balance Left Chann
B	Shaft			Not Req.	FKS-1/4	SK-5	Not Req.	
R7A	400Ω	1(WW)	40X452	WN-401	A43-400	W11-202	R500L	Hum Banance, Right Chann
B	Shaft			Not Req.	FKS-1/4	SK-5	Not Req.	

* Tap ⓐ 700K
† Taps ⓐ 750K & 1.5meg
‡ "STA-LOC" equivalent FA26DT155, RU26DT155, CS3500
▲ "STA-LOC" equivalent: FB26T75, RU26T75, CS3500
■ "STA-LOC" equivalent: FA16A, RU16A, CS-3500
▲ "STA-LOC" equivalent: FA55A, RU55A, CS-3500

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R8	33K		R41	100K		R74	3300Ω	
R9	10K		R42	1000Ω 1W		R75	2700Ω	
R10	1meg		R43	330Ω 1W		R76	470K	
R11	22K		R44	1meg		R77	330K	
R12	220Ω		R45	1meg		R78	560Ω 5%	
R13	1000Ω		R46	2.2meg		R79	180K	
R14	33Ω		R47	47K		R80	470K	
R15	470K		R48	470K		R81	82K	
R16	470K		R49	33K		R82	2200Ω	
R17	470K		R50	180K		R83	82K	
R18	220Ω		R51	470K		R84	100K	
R19	15K 1W		R52	220K		R85	100Ω	
R20	680Ω		R53	220K		R86	100K	
R21	3.3meg		R54	82K		R87	100Ω	
R22	12K		R55	2.2meg		R88	130Ω 5W	#43X396
R23	68K		R56	22K		R89	5100Ω 5%	
R24	100Ω		R57	22K		R90	470K	
R25	33Ω		R58	1meg		R91	330K	
R26	39K		R59	2.2meg		R92	560Ω 5%	
R27	47K		R60	47K		R93	180K	
R28	1meg		R61	1000Ω		R94	470K	
R29	4700Ω		R62	470K		R95	82K	
R30	6800Ω		R63	33K		R96	2200Ω	
R31	4700Ω		R64	180K		R97	82K	
R32	330Ω		R65	470K		R98	100K	
R33	68Ω		R66	220K		R99	100Ω	
R34	100K		R67	220K		R100	100K	
R35	100K		R68	82K		R101	100Ω	
R36	2.2meg		R69	2.2meg		R102	130Ω 5W	#43X396
R37	15K		R70	22K		R103	5100Ω 5%	
R38	15K		R71	22K		R104	8200Ω 2W	
R39	100K 5%		R72	1000Ω		R105	680Ω 4W	#43X338
R40	100K 5%		R73	3300Ω		R106	68Ω	

\# Airline Part Number

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		AIRLINE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil	9A2448	19-1000	19-1000	BC-561	4602		.9uh
L2	RF Choke	35A8						3.3uh ①
L3	FM RF Coil	9A2445						
L4	FM Mixer Coil	9A2446						
L5	Fil. Choke	35A6	19-1001	19-1001	BC-562	4604		1.5uh ①
L6	FM Osc. Coil	9A2447						
L7	RF Choke	35A8						3.3uh ①
L8	Loopstick	9A2441						
L9	AM RF Coil	9A2439						
L10	AM Osc. Coil	9A2438						
L11	1st FM IF	9A2440	16-3487	16-3487	FM-254	1463		
L12	Fil. Choke	35A6	19-1001	19-1001	BC-562	4604		1.5uh ①
L13	1st AM IF	9A2443	16-6758	16-6758	BC-352	12-C1	RF-1	
L14	2nd FM IF	9A2440	16-3487	16-3487	FM-254	1463		
L15	2nd AM IF	9A2443	16-6758	16-6758	BC-353	12-C2	RF-2	
L16	3rd FM IF	9A2440	16-3487	16-3487	FM-254	1463		
L17	Fil. Choke	35A6	19-1001	19-1001	BC-562	4604		1.5uh ①
L18	Discriminator	9A2442	17-3494	17-3494	FM-253	1464		

① IRC Part #CLA

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.6A	610 VCT @ .180A Tap @ 270 VCT @ .040A	5V @ 3A	53X378						
	SEC. 3	SEC. 4	SEC. 5							
	5V @ 2A	6.3V @ 2.6A	6.3V @ 2.1A							
	SEC. 6									
	6.3V @ 2.1A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6200Ω CT	6-8Ω	51X201	22S58	A-3028	AU-609	A-3880	22S58	S-55X	
T3	6200Ω CT	6-8Ω	51X201	22S58	A-3028	AU-609	A-3880	22S58	S-55X	

TRANSFORMER (MATCHING)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	16Ω	Tap @ 6-8Ω	51X196							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	12"	PM	8-10Ω	12A569	12A6AZ10	
SP2	12"	PM	8-10Ω	12A569	12A6AZ10	
SP3	Horn Type		14-16Ω	12A568		
SP4	3½"	PM	6-8Ω	12A566	3AQ7	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA									
	AIRLINE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ǂ 13TB	Not Req.	* 66	Not Req.			ǂ 8T-S	Not Req.	

* Use Mount PT-3
ǂ Includes mount

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	AIRLINE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	(78 RPM)	* W-101STS or * W-102S or * W-101STD	E98 † or E98D †	† Jewel ♦ Diamond * Includes Cartridge
	(LP)		E98X ♦ or E98XD ♦	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Tuning Cap.	14A235	5 Gang (AM Sections: Ant. 13—332mmf, RF 12—217mmf, Osc. 10—143mmf)
M4	Switch	2A506	Selector (AM-FM-FM AFC) (3 Position)
M5	Switch	2A503	Function (6 Position)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	10A963-1	Tuner
Knob	10A960-1	Preamp.
Pointer	15X286-1	
Dial Glass	58X812	
Dial Plate	25X2168-1	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

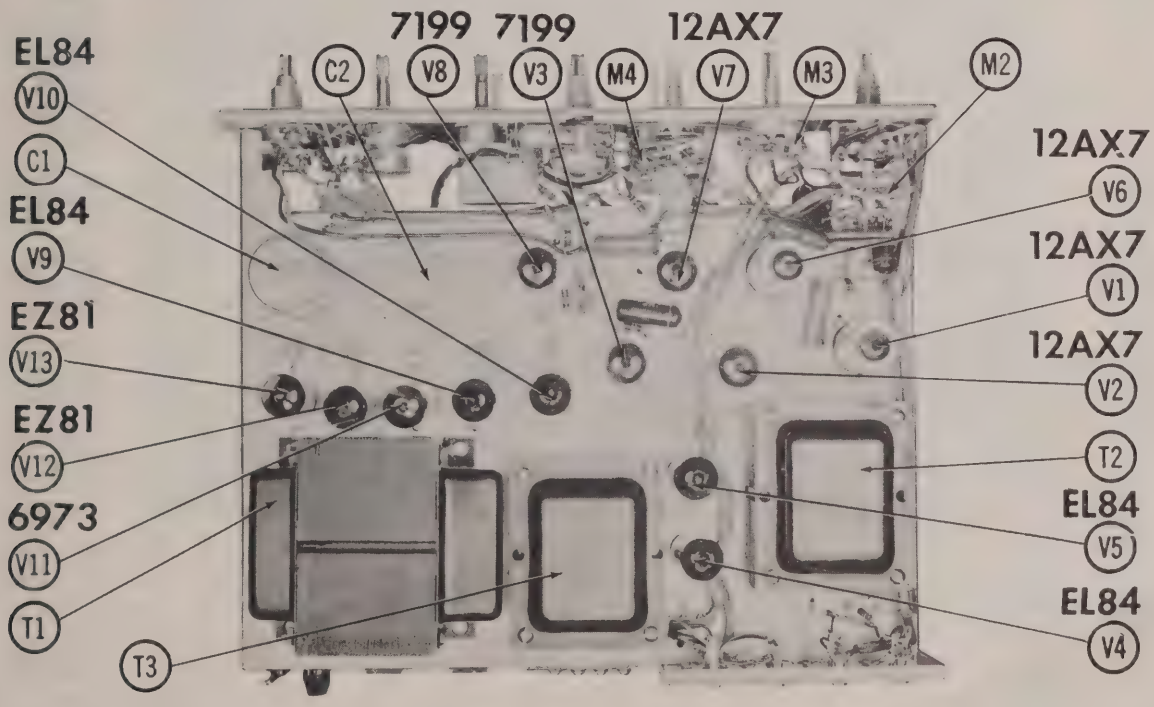
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

GROMMES
MODELS 40PG

GROMMES
MODELS 40PG

TRADE NAME	Grommes Model 40PG
MANUFACTURER	Precision Electronics Inc., 9101 King Ave., Franklin Park, Illinois
TYPE SET	AC Operated 13 Tube Stereo Amplifier
POWER SUPPLY	110-120 Volts AC, 50-60 Cycles RATING 130 Watts, 1.35 Amp. @ 117 Volts AC

GROMMES
MODELS 40PG



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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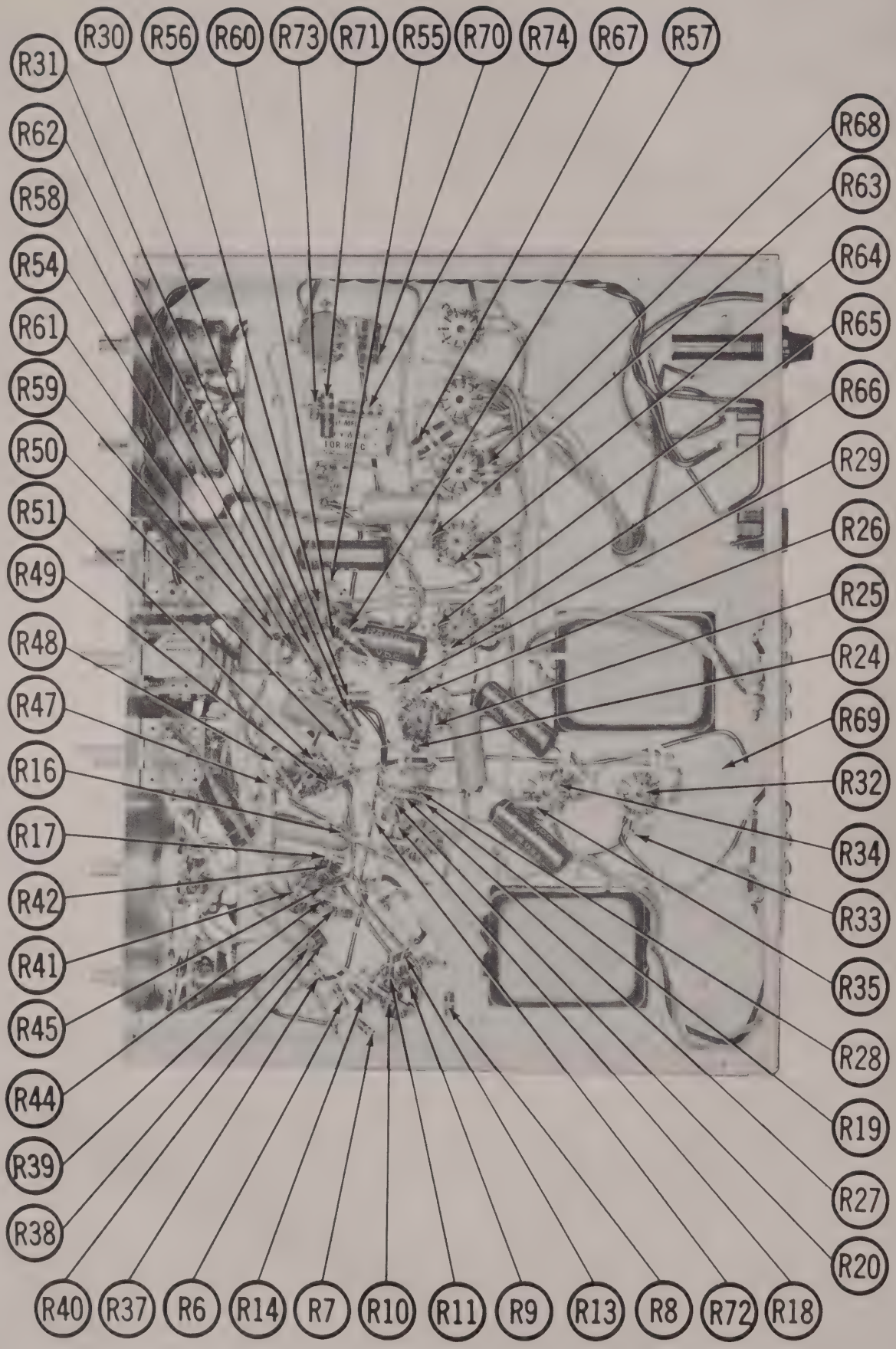
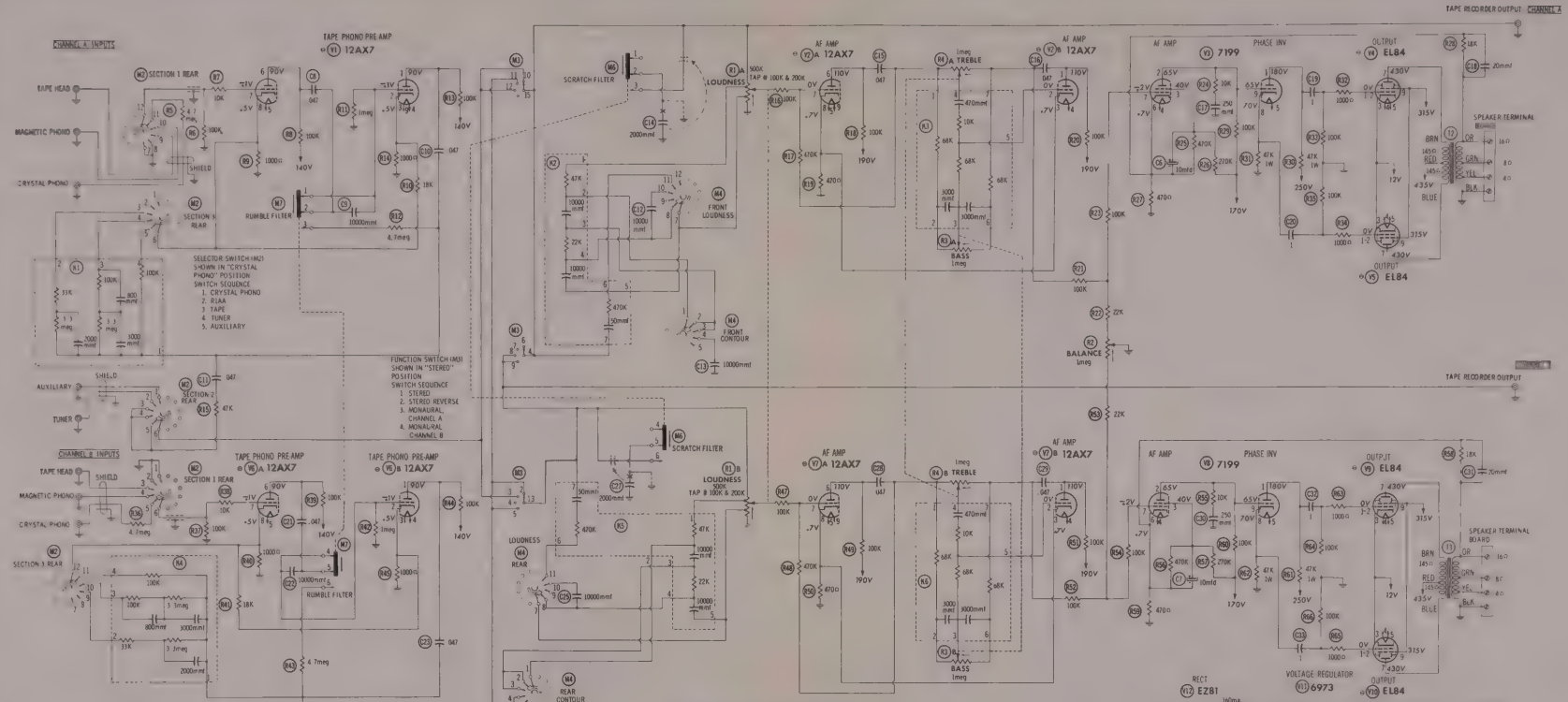
JV376



CHASSIS TOP VIEW—RESISTOR IDENTIFICATION



1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±1% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

FUNCTION SWITCH (M3) TERMINAL NUMBERING GUIDE

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	¶ 135K	1meg	1000Ω	47K	47K	¶ 135K	110K	1000Ω	47K
V2	12AX7	¶ 115K	850K	470Ω	47K	47K	¶ 115K	100K	470Ω	47K
V3	7199	¶ 52K	¶ 130K	¶ 220K	47K	47K	470Ω	500K	47K	¶ 130K
V4	EL84 6BQ5	100K	100K	100Ω	47K	47K	TP	†† 345Ω	TP	¶ 0Ω
V5	EL84 6BQ5	100K	100K	100Ω	47K	47K	TP	†† 345Ω	TP	¶ 0Ω
V6	12AX7	¶ 135K	1meg	1000Ω	47K	47K	¶ 135K	110K	1000Ω	47K
V7	12AX7	¶ 115K	850K	470Ω	47K	47K	¶ 115K	100K	470Ω	47K
V8	7199	¶ 52K	¶ 130K	¶ 220K	47K	47K	470Ω	500K	47K	¶ 130K
V9	EL84 6BQ5	100K	100K	100Ω	47K	47K	TP	†† 345Ω	TP	¶ 0Ω
V10	EL84 6BQ5	100K	100K	100Ω	47K	47K	TP	†† 345Ω	TP	¶ 0Ω
V11	6973	¶ 0Ω	NC	220K	47K	47K	220K	¶	TP	¶ 0Ω
V12	EZ81 6CA4	25Ω	NC	¶	47K	47K	NC	27Ω	NC	TP
V13	EZ81 6CA4	25Ω	NC	¶	47K	47K	NC	27Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V11. NC NO CONNECTION
†† MEASURED FROM PIN 3 OF V11. TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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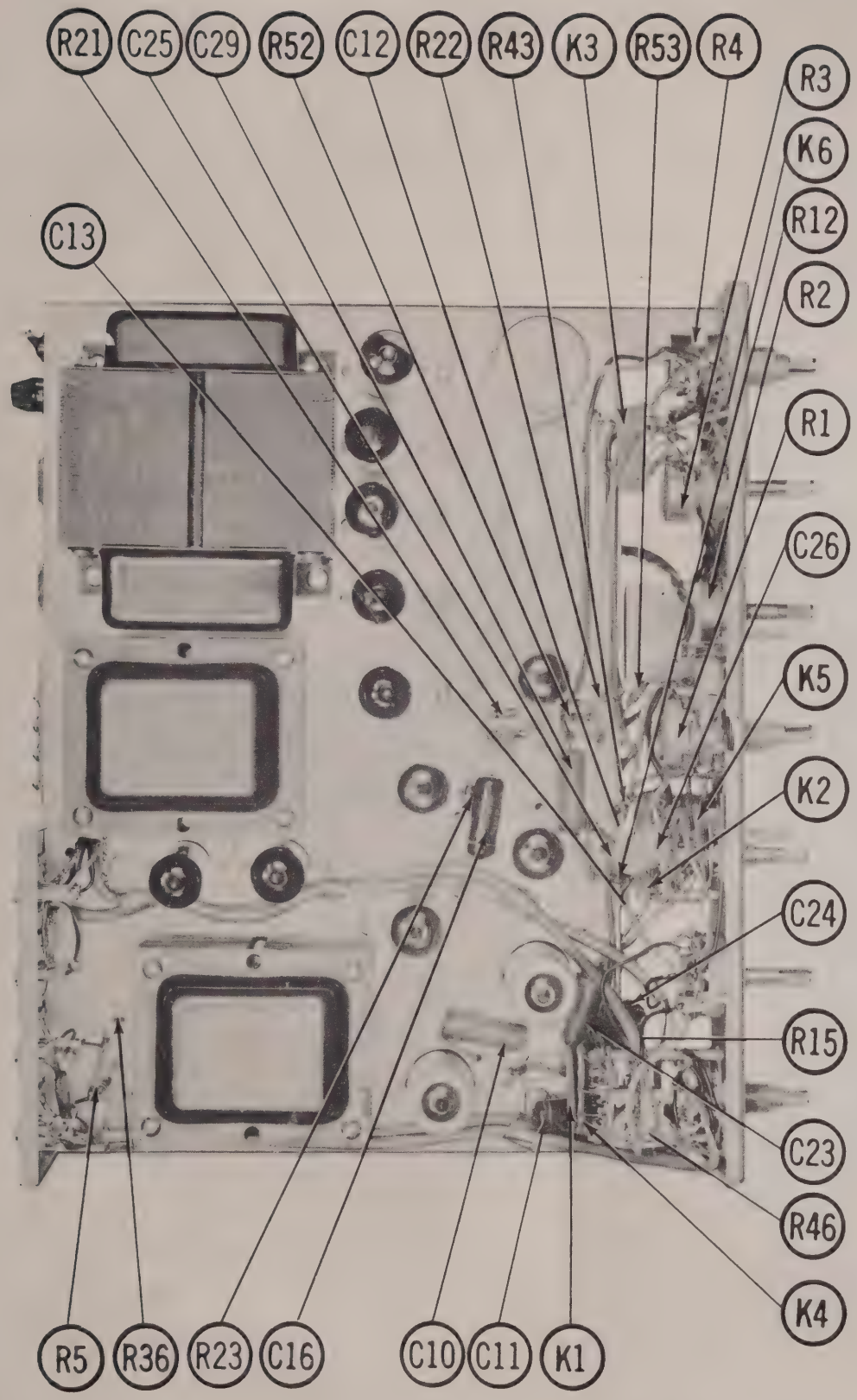
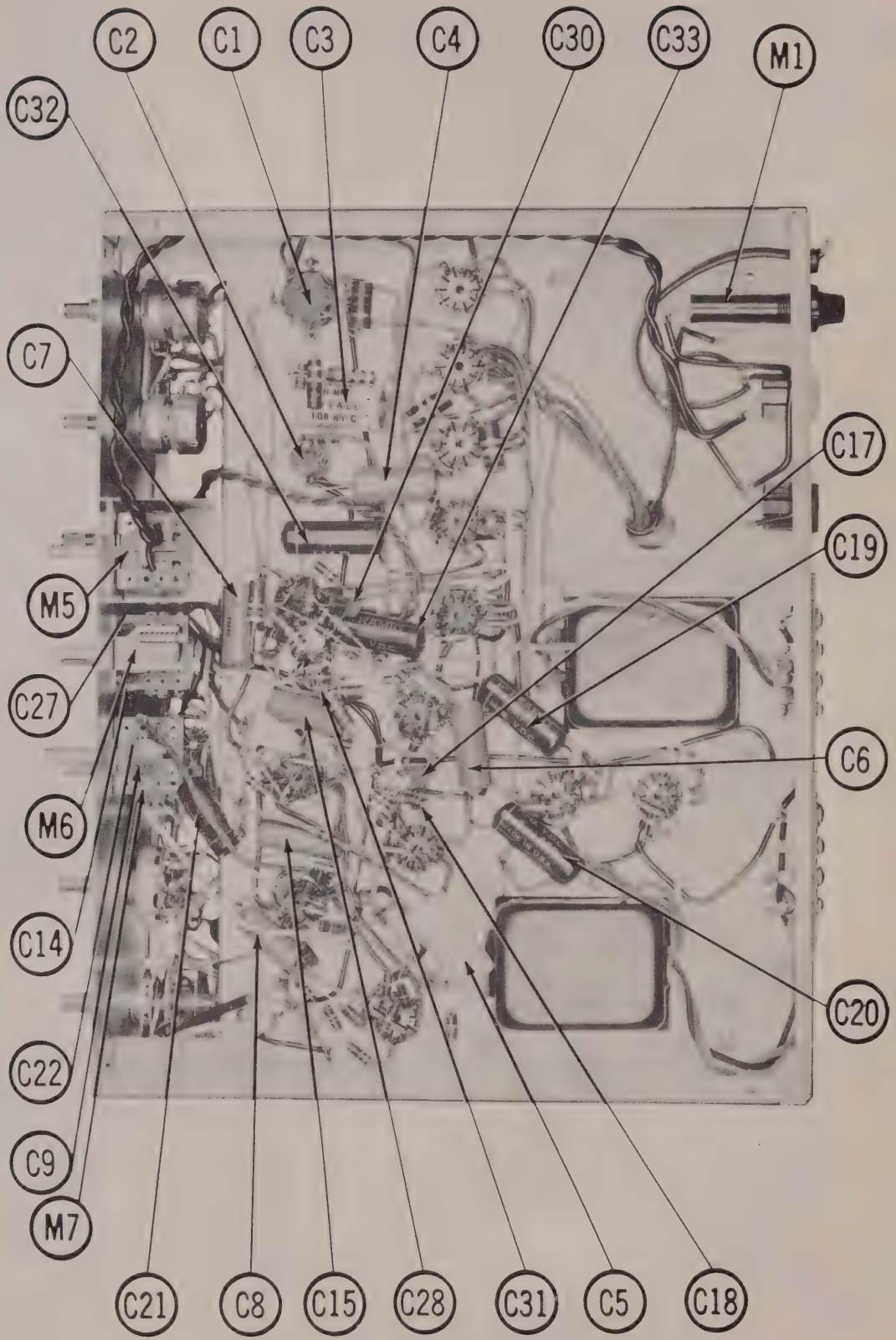
GROMMES MODELS 40PG



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND MISC. IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel A Tape-Phono Preamplifier	12AX7 ①
V2	Channel A AF Amplifier	12AX7 ①
V3	Channel A AF Amplifier - Channel A Phase Inverter	7199
V4	Channel A Output	EL84/6BQ5 ②
V5	Channel A Output	EL84/6BQ5 ②
V6	Channel B Tape-Phono Preamplifier	12AX7 ①
V7	Channel B AF Amplifier	12AX7 ①
V8	Channel B AF Amplifier - Channel B Phase Inverter	7199
V9	Channel B Output	EL84/6BQ5 ②
V10	Channel B Output	EL84/6BQ5 ②
V11	Voltage Regulator	6973
V12	Rectifier	EZ81/6CA4
V13	Rectifier	EZ81/6CA4

① Alternate Type 7025 or ECC83.

② Alternate Type 6BQ5/7189

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	GROMMES PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K *	1/2	LCK-500KS				◆ UE4024	Loudness, Channel B
B	500K *	1/2						Loudness, Channel A
R2A	1meg	1/2	TCK-1M	B-69	A47-1meg-S	Q11-137	U54	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	1meg	1/2	TCK-1MS	B-69	AD47-1meg-S	Q11-137		Bass, Channel B
B	1meg	1/2		SR-69	Not Req.	M11-137	† UE1706	Bass, Channel A
C	Shaft			Not Req.	KSS-3	Not Req.		
R4A	1meg	1/2	TCK-1MS	B-69	AD47-1meg-S	Q11-137		Treble, Channel B
B	1meg	1/2		SR-69	Not Req.	M11-137	† UE1706	Treble, Channel A
C	Shaft			Not Req.	KSS-3	Not Req.		

* Taps @ 100K, 200K.
◆ "STA-LOC" Equivalent: FB55DT25, RU55DT25, CS3500.
† "STA-LOC" Equivalent: FA16L, RU16L, CS3500.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	GROMMES PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▰40	450		AFH3-50-05	C0372	FP396.1	TMQ-90	TVL-4731	
B	■20	450							
C	▲20	450							
C2A	■10	350		AFH2-47	B0370	FP231	TMD-47	TVL-2750	
B	▲10	350							
C3	10	250		PRS350V10	BR1045	TC52	TD-10-250	TVA-1504	
C4	50	50		PRS50V50	BR505	TC39	TD-50-50	TVA-1308	
C5	10	250		PRS350V10	BR1045	TC52	TD-10-250	TVA-1504	
C6	10	250		PRS350V10	BR1045	TC52	TD-10-250	TVA-1504	
C7	10	250		PRS350V10	BR1045	TC52	TD-10-250	TVA-1504	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C8	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C11	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C15	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C16	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C17	250		DI-250	DD-251	L10T25	CCD-251	B-322	5GA-T25
C18	20		DI-20	DD-200	L10Q2	CCD-200	B-418	5GA-Q20
C19	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C20	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C21	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C24	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C28	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C29	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C30	250		DI-250	DD-251	L10T25	CCD-251	B-322	5GA-T25
C31	20		DI-20	DD-200	L10Q2	CCD-200	B-418	5GA-Q20
C32	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C33	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	4.7meg	
R6	100K	
R7	10K	
R8	100K	
R9	1000Ω	
R10	18K	
R11	1meg	
R12	4.7meg	
R13	100K	
R14	1000Ω	
R15	47K	
R16	100K	
R17	470K	
R18	100K	
R19	470Ω	
R20	100K	
R21	100K	
R22	22K	
R23	100K	
R24	10K	
R25	470K	
R26	270K	
R27	470Ω	
R28	18K	

ITEM No.	RATING	REMARKS
R29	100K	
R30	47K 1W	
R31	47K 1W	
R32	1000Ω	
R33	100K	
R34	1000Ω	
R35	100K	
R36	4.7meg	
R37	100K	
R38	10K	
R39	100K	
R40	1000Ω	
R41	18K	
R42	1meg	
R43	4.7meg	
R44	100K	
R45	1000Ω	
R46	47K	
R47	100K	
R48	470K	
R49	100K	
R50	470Ω	
R51	100K	
R52	100K	

ITEM No.	RATING	REMARKS
R53	22K	
R54	100K	
R55	10K	
R56	470K	
R57	270K	
R58	18K	
R59	470Ω	
R60	100K	
R61	47K 1W	
R62	47K 1W	
R63	1000Ω	
R64	100K	
R65	1000Ω	
R66	100K	
R67	100K 2W	
R68	220K 2W	
R69	100Ω 7W	
R70	5600Ω 2W	
R71	10K	
R72	22K	
R73	22K	
R74	47K 1W	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.35A	700VCT @ .160A	6.3VCT @ 6.8A	TP-14		P-2954 ①				R-16B ⊥

① Use original mounting brackets.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9000Ω CT	16Ω Taps ② 8Ω, 4Ω	TO-20C	22S93 ①	A-3132 ①		A-3311 ①	22S93 ①	S-31A ①	① Use original shields
T3	9000Ω CT	16Ω Taps ② 8Ω, 4Ω	TO-20C	22S93 ①	A-3132 ①		A-3311 ①	22S93 ①	S-31A ①	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			GROMMES PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	5A 250V			312005. (3AG 5A 250V)	342001	AGC5	HKP

MISCELLANEOUS

ITEM No.	PART NAME	GROMMES PART No.	NOTES
M2	Switch		Selector
M3	Switch		Function
M4	Switch		Loudness Contour
M5	Switch		Power Off-On
M6	Switch		Scratch Filter
M7	Switch		Rumble Filter

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	GROMMES PART No.	REPLACEMENT DATA
K1	Channel A Rumble Filter	800mmf, 2000mmf, 3000mmf, 33K, 100K, 100K, (2) 3.3meg	DC-1960	
K2	Channel A Contour Comp.	50mmf, 10000mmf, 10000mmf, 22K, 47K, 470K	LC-195	
K3	Channel A Tone Comp.	470mmf, 3000mmf, 3000mmf, 10K, 68K, 68K, 68K	TC-190	
K4	Channel B Rumble Filter	800mmf, 2000mmf, 3000mmf 33K, 100K, 100K, (2) 3.3meg	DC-1960	
K5	Channel B Contour Comp.	50mmf, 10000mmf, 10000mmf, 22K, 47K, 470K	LC-195	
K6	Channel B Tone Comp.	470mmf, 3000mmf, 3000mmf, 10K, 68K, 68K, 68K	TC-190	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

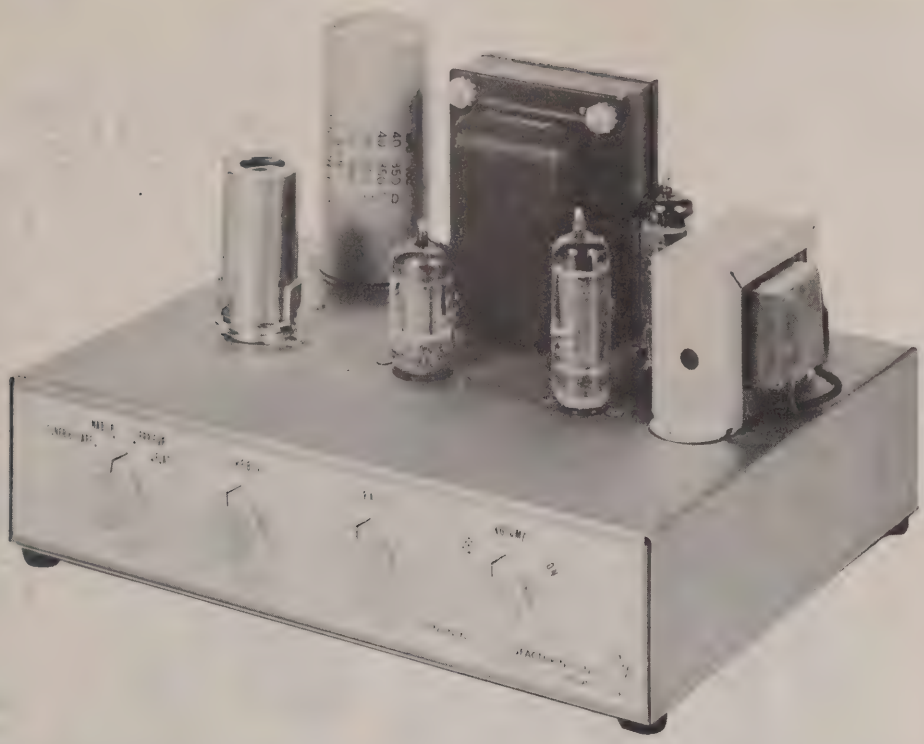
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

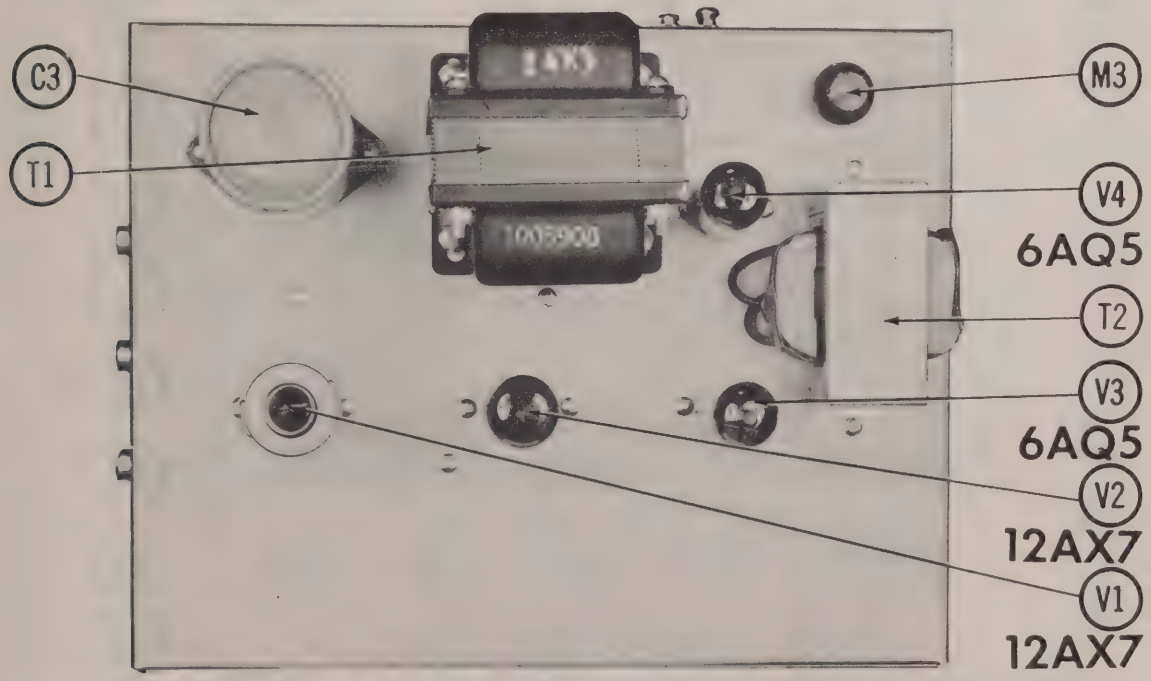
HARMONY
MODEL M.A. -10

HARMONY
MODEL M.A. -10



HARMONY
MODEL M.A. -10

TRADE NAME	Harmony Model M. A. -10
MANUFACTURER	Continental Manufacturing, Inc., 1612 California Street, Omaha, Nebraska
TYPE SET	AC Operated 4 Tube Audio Amplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 35 Watts, .4 Amp. @117 Volts AC



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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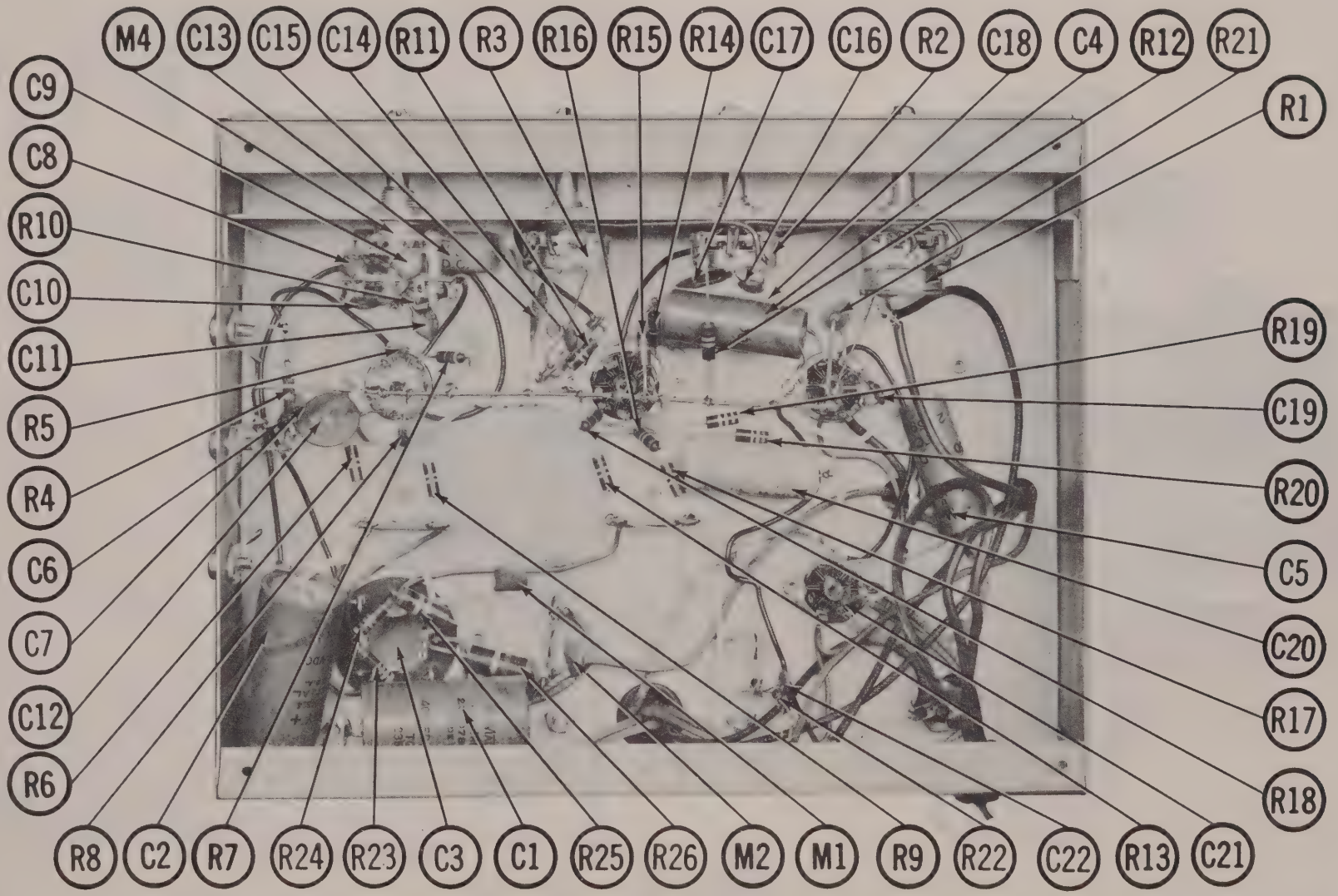
JX397

SET 466 FOLDER 6



CHASSIS-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆		GENERAL ELECTRIC ◆		RAYTHEON ◆		SYLVANIA ◆
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	
V1	Phono Preamp.	12AX7	V3	Output	6AQ5A	
V2	AF Amp. -Phase Inv.	12AX7	V4	Output	6AQ5A	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	HARMONY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	40	150		PRS1470	BR4015	TC48	TD-40-150	TVA-1413	
C2	40	150		PRS1470	BR4015	TC48	TD-40-150	TVA-1413	
C3A	▲40	350		AFH4-06-40	D0054	FP421.9	TMQ-119	TVL-4674	
B	20	350							
C	▲30	350							
D	■40	350							
C4	50	25		PRS1265	BBR50-25	TC29	TD-50-25	TVA-1206	
C5	50	25		PRS1265	BBR50-25	TC29	TD-50-25	TVA-1206	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C7	47	(22mmf) *	BPD-000047	DD-470	L10Q47	CCD-470	UC-5447	5GA-Q47
C8	2000	①	BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C9	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C10	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C11	3300		BPD-0033	DD-332	BYA10D3	CCD-332	B-233	5HK-D33
C12	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C13	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C14	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C15	20000	(5000mmf) *	BPD-02	DD-203	BYB6S2	CCD-203	GEM-402	5HK-S20
C16	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C17	20000		BPD-02	DD-203	BYA10S2	CCD-203	B-120	5HK-S20
C18	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C19	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C20	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C21	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C22	100		BPD-0001	DD-101	L10T1	CCD-101	UC-531	5GA-T10

* Alternate
① Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HARMONY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½		B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2A	500K	½		B-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½		B-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	1.5meg	
R5	47K	
R6	100K	
R7	470Ω	
R8	3.3meg	
R9	100K	
R10	100K	
R11	100K	

* Alternate

ITEM No.	RATING	REMARKS
R12	22K	
R13	220K	
R14	100Ω	
R15	1000Ω	
R16	100K	
R17	220K	
R18	1000Ω	
R19	470K	

ITEM No.	RATING	REMARKS
R20	470K	
R21	270Ω 2W	
R22	22K	(4700Ω) *
R23	33K	
R24	47K	(22K) *
R25	10K 1W	
R26	1500Ω 2W	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	HARMONY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .40A	115V@ .220A (AC)	6.3 VCT @1.6A	14K3						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HARMONY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5600Ω CT	6-8Ω	14W1	22S58	A-3028①	AU-609	A-3870	22S58	S-55X	① Drill New Mounting Hole

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	HARMONY PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.050A	①	HA154 ①	5E4 ①	K200 ①	SR200 ①	① Silicon Type
M2	.050A	①	HA154 ①	5E4 ①	K200 ①	SR200 ①	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			HARMONY PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	2A 250V			312002 (3AG 2A 250V)	342001	AGC 2	HKP

MISCELLANEOUS

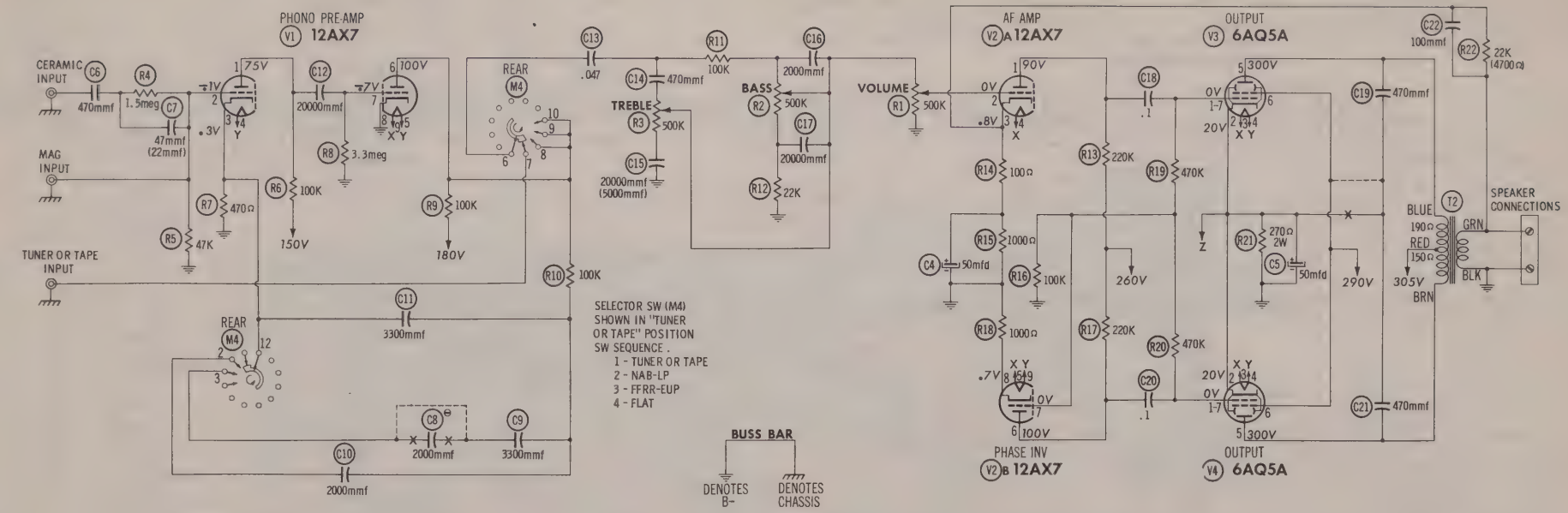
ITEM No.	PART NAME	HARMONY PART No.	NOTES
M4	Switch		Function

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

HARMONY
MODEL M.A. -10

FOLDER 6

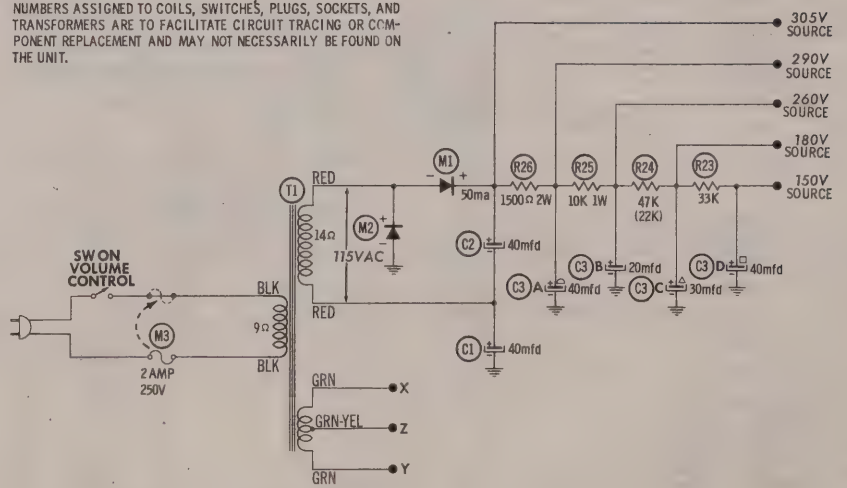


RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†190K	47K	470Ω	270Ω	270Ω	†160K	3.3meg	0Ω	270Ω
V2	12AX7	†230K	0Ω	1100Ω	270Ω	270Ω	†230K	100K	1000Ω	270Ω
V3	6AQ5A	570K	270Ω	270Ω	270Ω	†190Ω	†1500Ω	570K		
V4	6AQ5A	570K	270Ω	270Ω	270Ω	†150Ω	†1500Ω	570K		

† MEASURED FROM OUTPUT OF M1

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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HARMONY
MODEL M.A. -10

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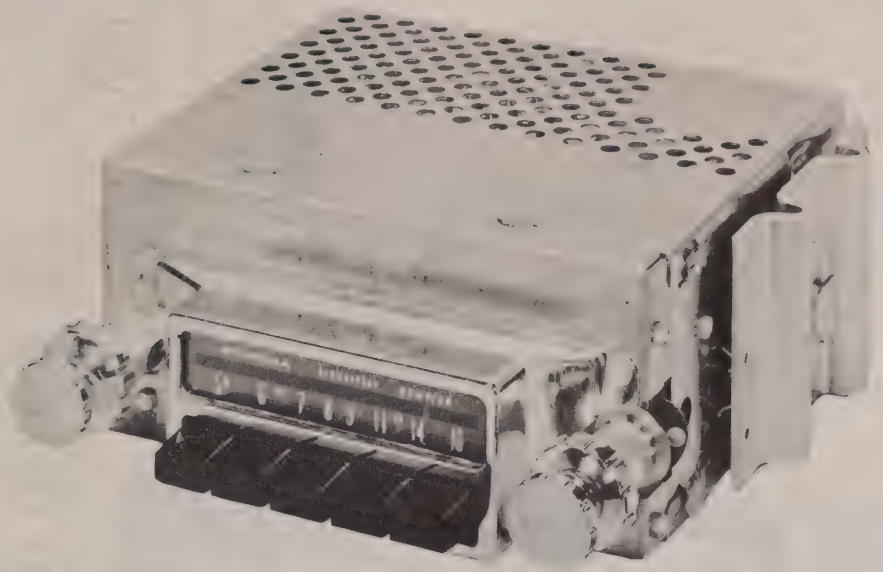
MOTOROLA
MODEL OEA9X



TRADE NAME	Motorola Model OEA9X (For 1959 Oldsmobile Automobiles)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated 4 Tube Custom Built Automobile AM Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
RATING	1.1 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540 — 1610 KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set tone to treble.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested alignment tools:

A1 thru A4..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

A5, A6, A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A8, A9, A10..... GENERAL CEMENT #9050L, 9150
WALSCO #2521

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	262.5KC (400∿ Mod.)	High end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores 7/16" out of coils. Repeat Step 2.						
3.	Fig. 1.	Thru dummy to antenna receptacle.	1200KC	Tuner carriage 9/32" from high end stop.	Across voice coil	A8, A9, A10	Adjust for maximum deflection. Repeat steps 2 & 3. Cement cores.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.						

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining pushbuttons.

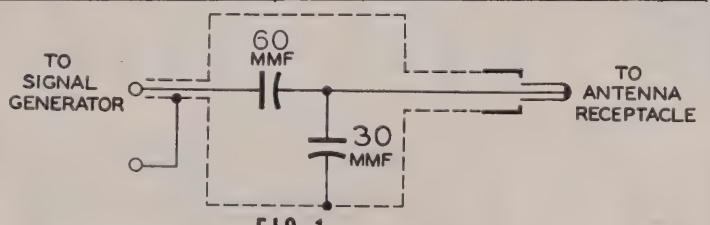


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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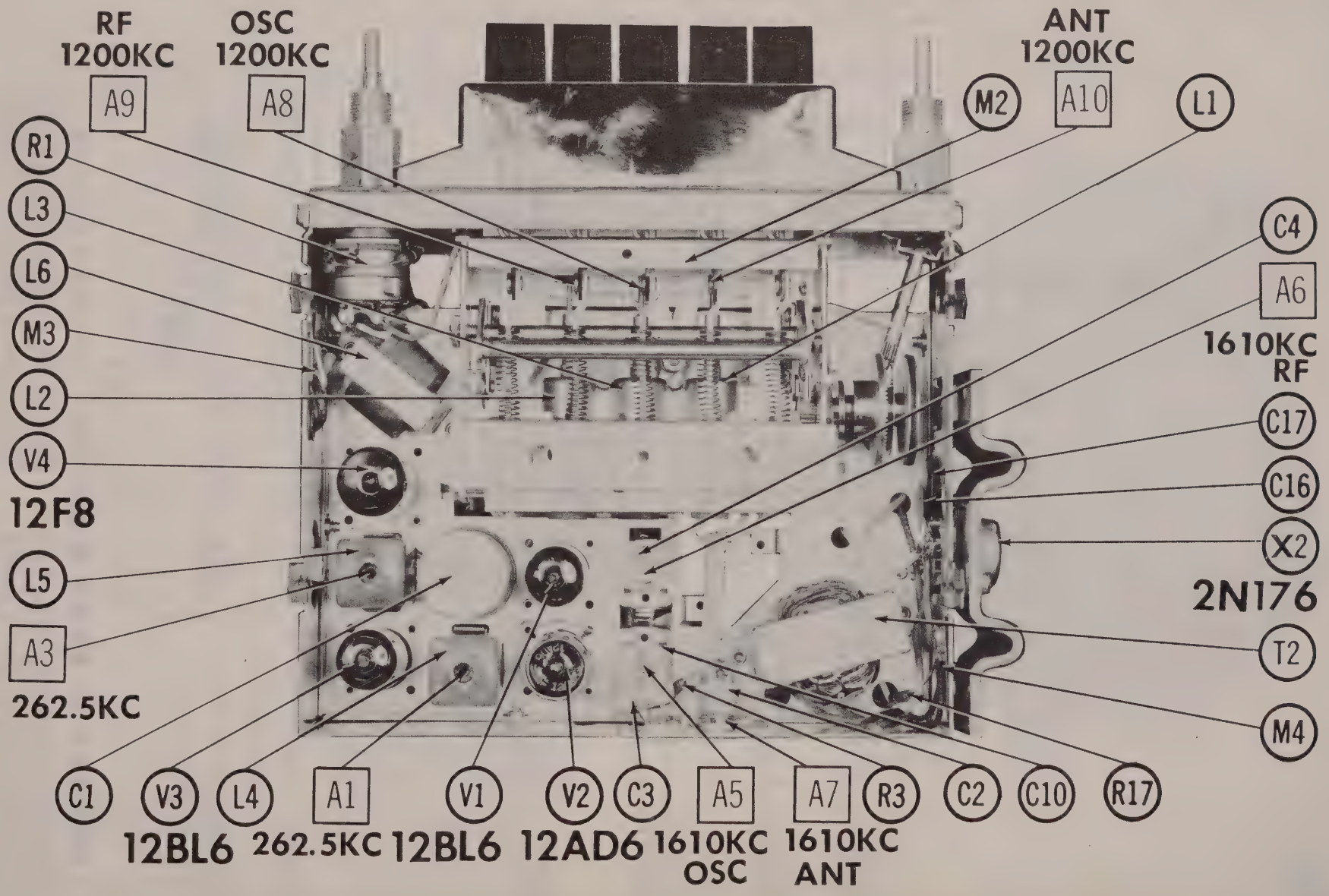
MOTOROLA
MODEL OEA9X

MOTOROLA
MODEL OEA9X

SET 466 FOLDER 7



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12BL6	V3	IF Amplifier	12BL6
V2	Converter	12AD6	V4	Det. -AVC-AF Amp.	12F8

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	MN53①	Driver	2N155	2N176	MN-53	2N176	PNP
X2	2N176 *	Output					PNP

① 2N652 Alternate Type.
* When replacing, apply DC-4 grease (Part #1M490487) or equivalent to both sides of insulator. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■500	16	23B543279	AFH3-00-95		WP300.85		TVLS-3026.8*	
B	▲500	16							
C	100	16							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	40-430	#20K542441						
C3	.002 1000V 10%					16DP-1-202	GEM-1622	10TM-D22
C4	20-120	#20K541014				302		
C5	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C6	.05 200V		P288N-05	DF-503	CUB2S5	4DP-3-503	GTM-215	2TM-S5
C7	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C8	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C9	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C10	310-390	#20K541700						
C11	27 NPO 10%			TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	.002 600V		P688N-002	DD-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	25000					6DP-3-253	GEM-6125	5HK-S25
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

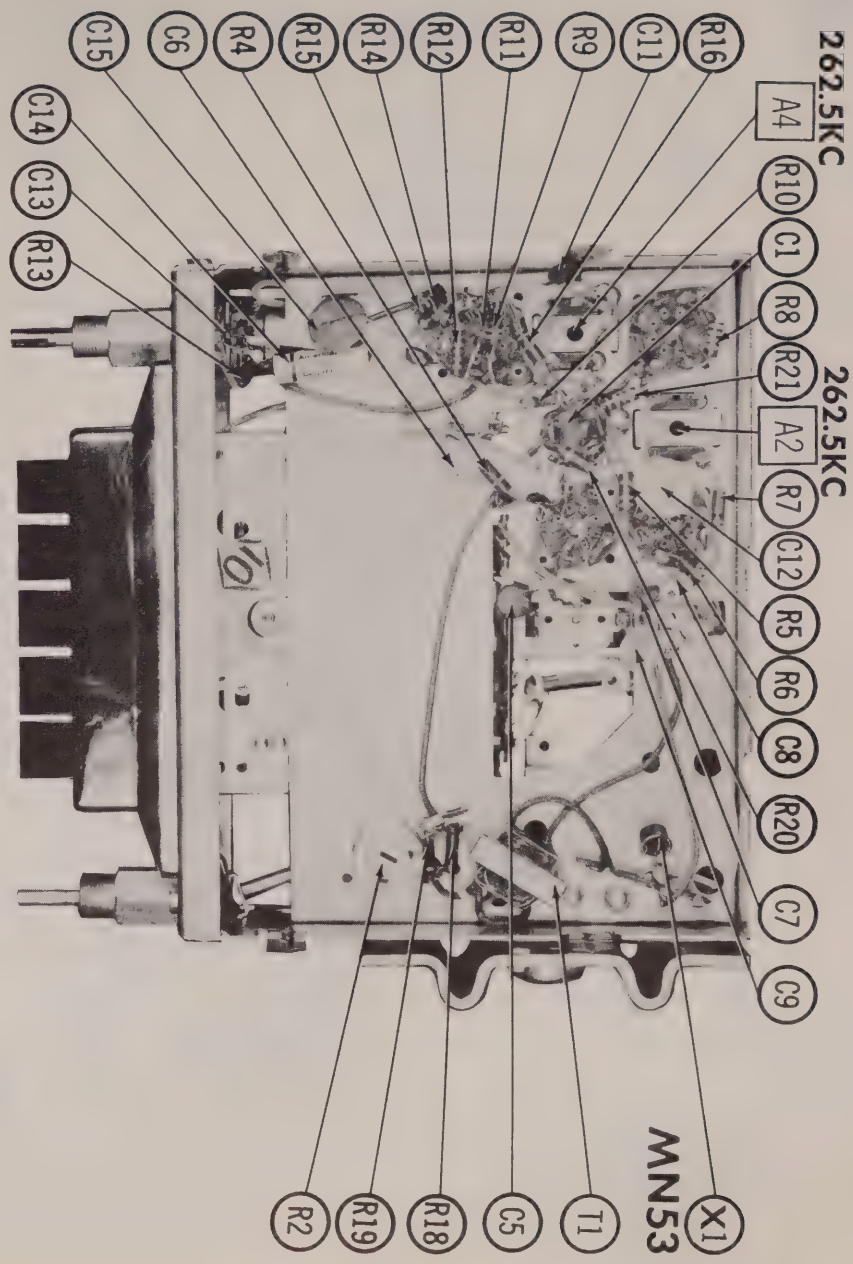
Motorola Part Number

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	18K542925	F1-41	RTV-654C			Tone
B	2meg	½		R2-75	1meg	■ QJ-1083A	▲ UE3628S	Volume, 1meg tap
C	Switch			KR-4				Off-On
R2	300Ω	1½(WW)	18K543493		39-300 *	112-300 *	FL-500 *	Bias, Stop@36Ω

■ "Concentrikit" equivalent: K-6 Kit with base elements and shafts: B13-133, P13-118 (Panel) B18-139X, R1-130, (Rear) 76-1 (Switch)
▲ "STA-LOC" equivalent: FA55A, RU26T16, OS1562, IS2000, US-41
* Use 36Ω resistor in series with terminal.

CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	22K	
R4	22meg	
R5	3300Ω	
R6	47K	
R7	1meg	
R8	330Ω	(470Ω) *
R9	4.7meg	
R10	91meg	#6K538716
R11	3.3meg	
R12	1.5meg	
R13	100K	
R14	2.7meg	
R15	3.3meg	
R16	1800Ω	(3300Ω) *
R17	680K	Note 1
R18	10Ω (Cold)	#6K540634
R19	10Ω	
R20	1200Ω	Note 1
R21	680Ω	(330Ω) *

* Alternate
Note 1. Not used in later versions.
Motorola Part Number

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	24C535458 †						† Part of M2
L2	RF Coil	24C535458 †						
L3	Osc. Coil	24C535456 †						
L4	Input IF	24B543286	16-6752	16-6752	BC-350	12-H2	RF-3	
L5	Output IF	24K543287	16-6754	16-6754	BC-354	12-H6		

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L6	1.1A	.56Ω	.010 HY	25B5377543						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	20	1	25K543619						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA							NOTES
	PRI.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	24Ω Tap@ 3-4Ω	25C542489							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6"x 9"	PM	3-4Ω	50C543633	69A3	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	9A 32V	65R16248		307009 (9A 32V)		SFE9	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Tuner	77D562548	(AT-281) Less Push Buttons & Pointer
M3	Spark Plate	64K530177	
M4	Spark Plate	64K535152	

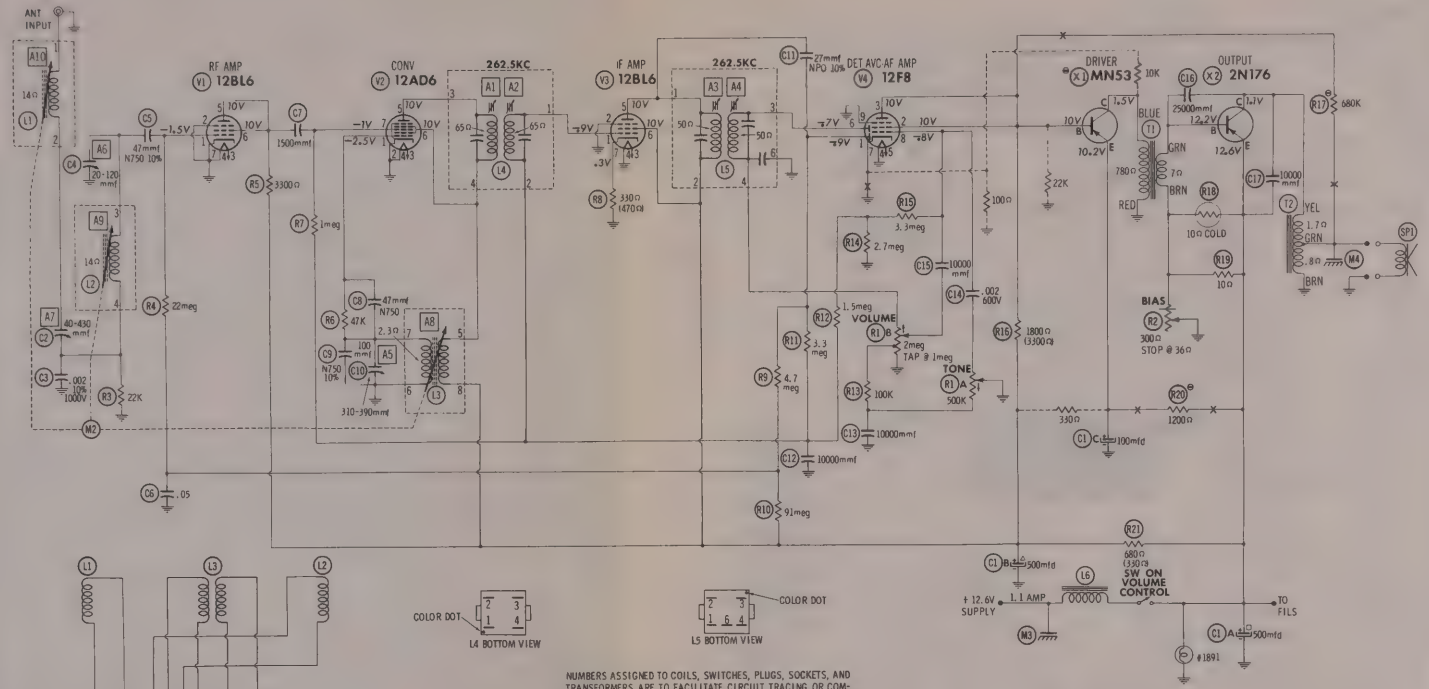
CABINETS & CABINET PARTS

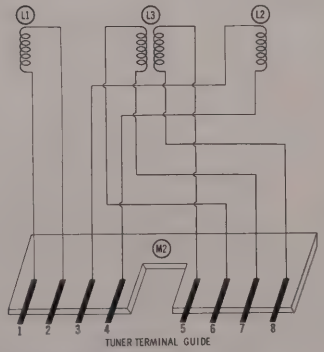
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	1V538924	Control
Knob	36B513220	Tone
Knob	36K513223	Dummy
Pushbutton	38B542665	
Pointer	1V538739	
Dial Scale	34B543641	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661





TUNER TERMINAL GUIDE

L4 BOTTOM VIEW

L5 BOTTOM VIEW

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

X2 BOTTOM VIEW

X1 BOTTOM VIEW

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	25meg	0Ω	2.1Ω	0Ω	†430Ω	†1000Ω	0Ω		
V2	12AD6	47K	0Ω	2.1Ω	0Ω	†745Ω	†680Ω	5.2meg		
V3	12BL6	4meg	0Ω	2.1Ω	0Ω	†730Ω	†680Ω	330Ω		
V4	12F8	7.5meg	¶	¶	0Ω	2.1Ω	1meg	0Ω	5meg	0Ω

¶ TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
† MEASURED FROM JUNCTION OF R20 AND C1A.

TRANSISTOR CURRENT ADJUSTMENT (R2)

Connect a 0-3A. DC ammeter in series with the "A" lead. Remove the Output Transistor from its socket. Turn the radio on and set the applied voltage at 12.6 volts. Note the current reading obtained on the meter. Replace the transistor in its socket and recheck the applied voltage for 12.6 volts. Adjust R2 to obtain a current reading of 360MA higher than previously obtained.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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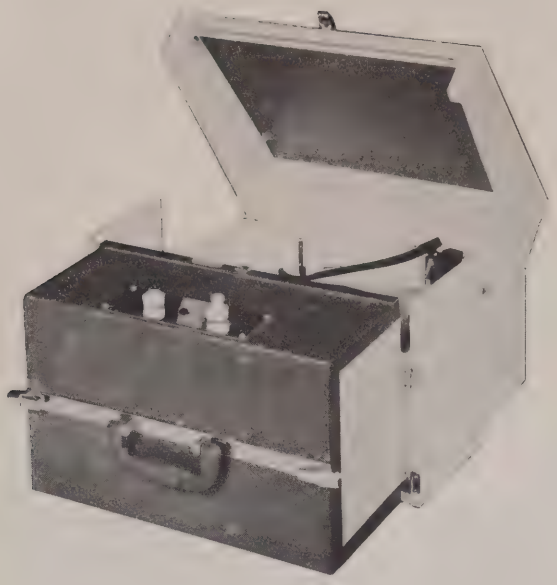
MOTOROLA MODEL OEA9X

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PHILCO MODEL G-1410

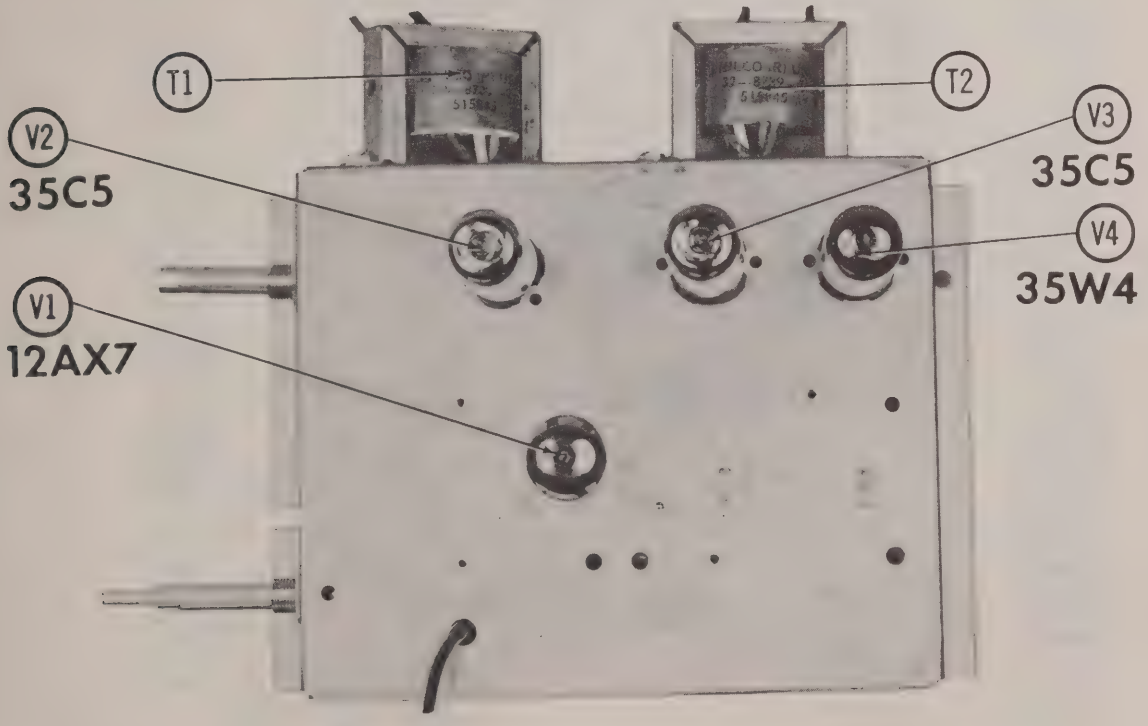
PHILCO MODEL G-1410



TRADE NAME	Philco Model G-1410
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	AC Operated 4 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105-125 Volts AC, 60 Cycles RATING 31 Watts, .35 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER M-40 — SEE SIMILAR V-M 959 — PHOTOFACT SET 396 FOLDER 13

PHILCO MODEL G-1410



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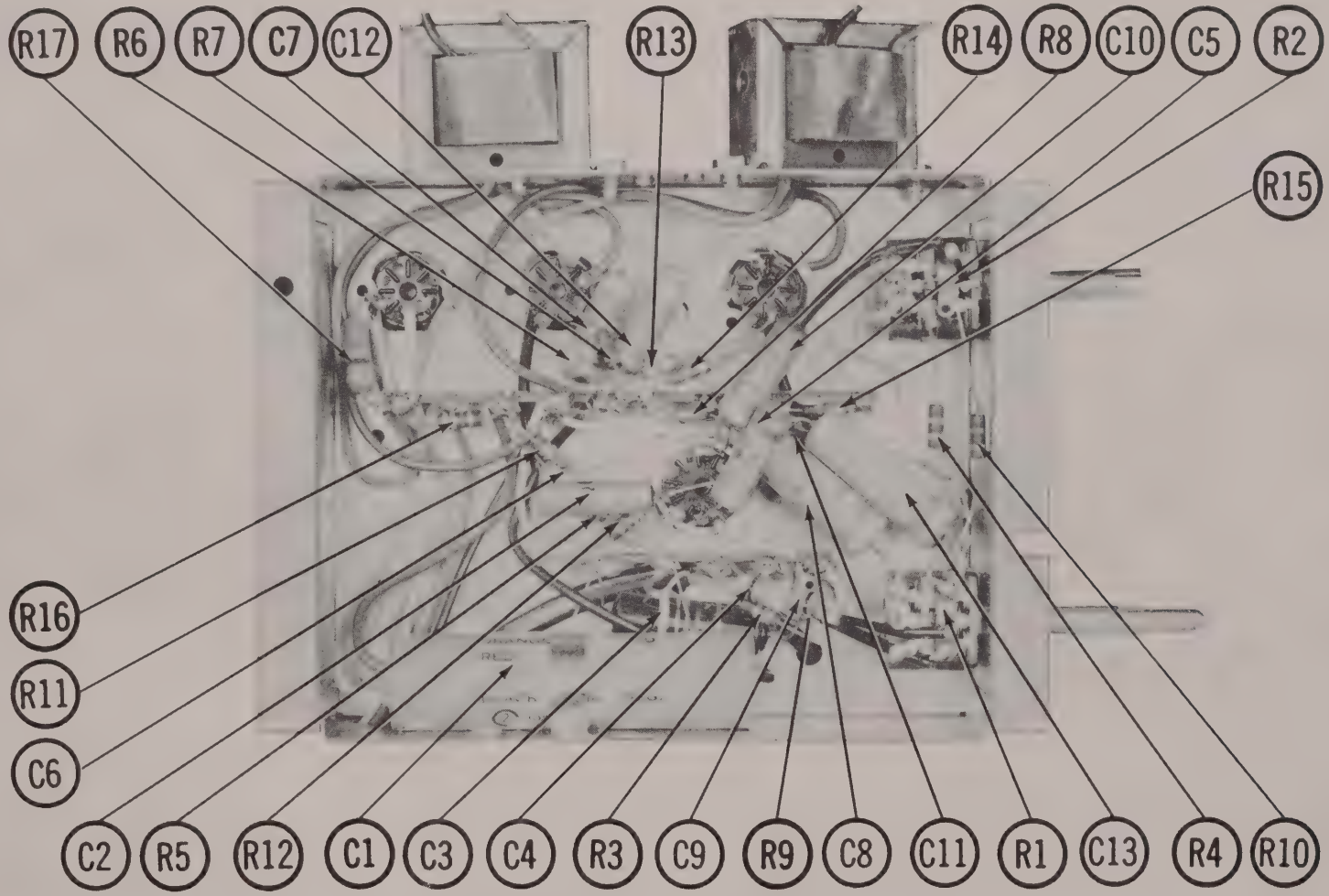
JN368

SET 466 FOLDER 8



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7
V2	Channel 1 Output	35C5
V3	Channel 2 Output	35C5
V4	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	30-2575-48	PRS3800	BBRT84215	TCT3119	TDLT-7	TVA-3556	
B	60	150							
C	20	150							
C2	100	3	30-2588-2	PWE3100	EC100-6	TT6X100	ML100-3	TE-1059.5	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	47		SI 47	D6-470	L10Q47	CCD-470	UC-5447	5GA-Q47
C5	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C6	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C7	.0022 600V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C8	.068 400V		P488N-068		CUB6S68	4DP-3-683	GEM-4168	4TM-S68
C9	47		SI 47	D6-470	L10Q47	CCD-471	UC-5447	5GA-Q47
C10	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-4247	6TM-D47
C11	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C12	.0022 600V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C13	.068 400V		P488N-068		CUB4S68	4DP-3-683	GEM-4168	4TM-S68
C14	.047 600V		P688N-047	DF-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	33-5598-2					Loudness, Channel #1
B	2meg	½						Balance, Channel #2
R2A	500K	½	33-5573-51					Tone, Channel #1
B	500K	½						Tone, Channel #2

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	33K	
R4	120Ω	
R5	270K	
R6	470K	
R7	120Ω	
R8	1200Ω	

ITEM No.	RATING	REMARKS
R9	33K	
R10	120Ω	
R11	270K	
R12	4700Ω	
R13	470K	
R14	120Ω	

ITEM No.	RATING	REMARKS
R15	1200Ω	
R16	3300Ω	
R17	47Ω 1W	
R18	1.5meg	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2500Ω	400Ω	32-8739-2							
		SEC. 2								
		3-4Ω								
		SEC. 1								
T2	2500Ω	400Ω	32-8739-2							
		SEC. 2								
		3-4Ω								

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	PHILCO PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3-4Ω	36-1669-14	52A1	
SP2	5"	PM	3-4Ω	36-1669-14	52A1	

PHONO CARTRIDGE

ITEM No.	PHILCO PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M1	325-8039 ①	13T	Not Req.	* 66	Not Req			8T-S	Not Req.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	PHILCO PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M2	325-8039 ①		CS-11 ①	① Includes Cartridge

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Switch	42-2075-7	Stereo - Monaural (SPDT, Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Bezel	28-12797-1	
Knob	54-6407-6	Volume
Knob	54-6407-5	Tone
Knob	54-6046-5	Balance
Handle	54-5211-17	

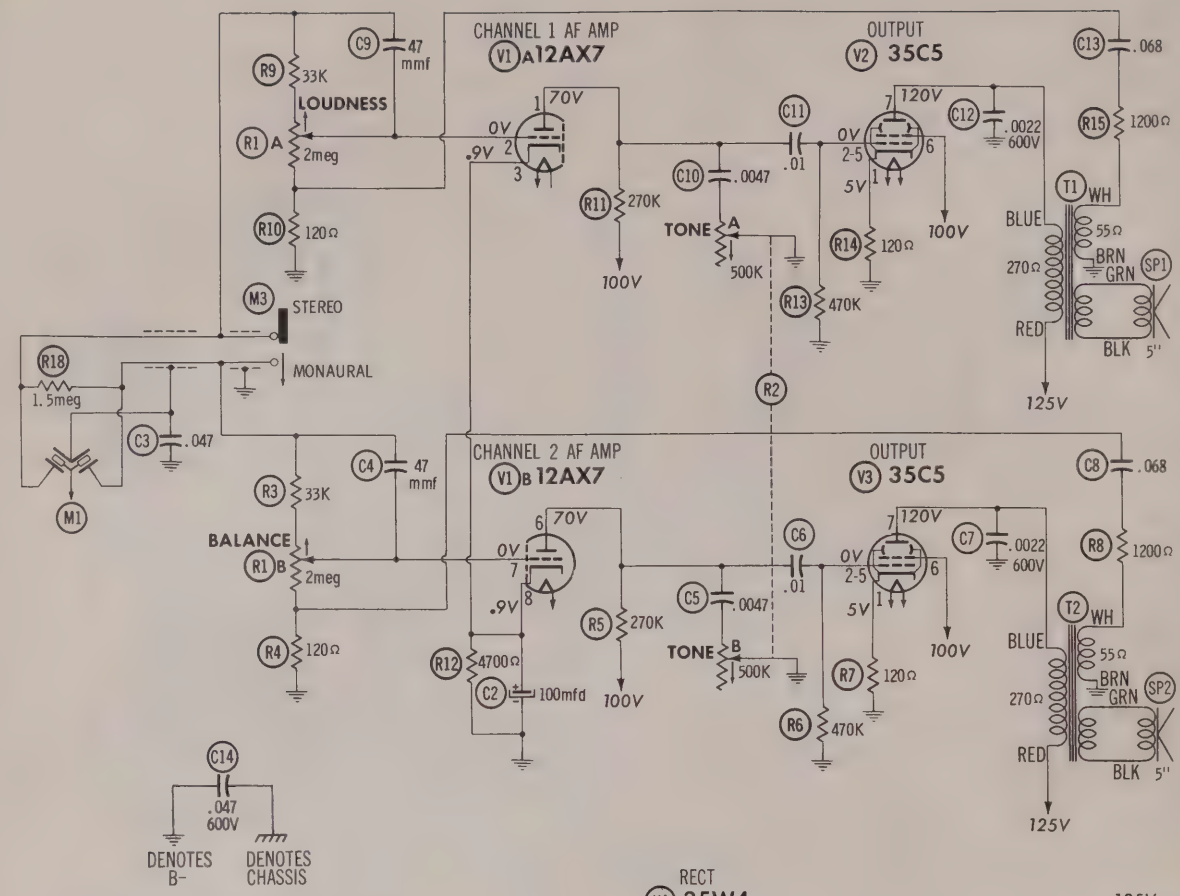
WIRING DATA

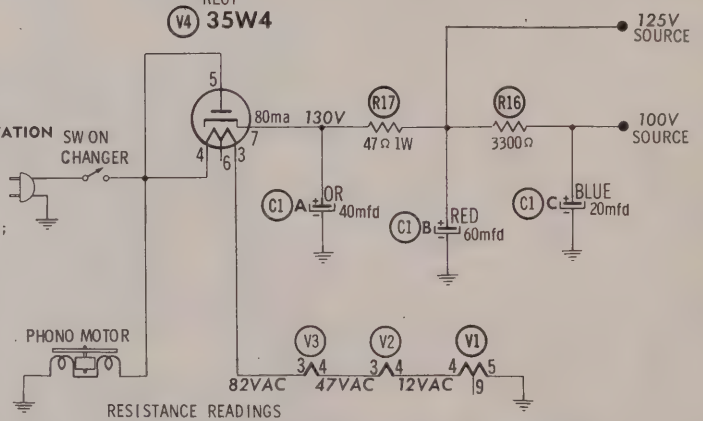
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)





⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†270K	120Ω	4700Ω	12Ω	0Ω	†270K	120Ω	4700Ω	6Ω
V2	35C5	120Ω	470K	47Ω	12Ω	470K	†3300Ω	†320Ω		
V3	35C5	120Ω	470K	82Ω	47Ω	470K	†3300Ω	†320Ω		
V4	35W4	NC	NC	82Ω	115Ω	115Ω	105Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4
NC NO CONNECTION

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PHILCO MODEL G-1410

PHOTOFACT* Folder with CIRCUITRACE*
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

REGENCY MODEL TR-11

REGENCY MODEL TR-11

REGENCY MODEL TR-11

TRADE NAME	Regency Model TR-11
MANUFACTURER	Regency Div., I.D.E.A., Inc., 7900 Pendleton Pike, Indianapolis 26, Indiana
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	4.5 Volts DC
RATING	7MA @ 4.5 Volts DC (No Signal, Min. Volume) 10MA @ 4.5 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535 - 1630KC

ALIGNMENT INSTRUCTIONS

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	535KC (400~ Mod.)	Low end of dial	Use speaker	L2	Fashion loop of several turns of wire and radiate signal into loop of receiver. Rotate L2 for maximum regeneration (below oscillation).
2.		"	1630KC	High end of dial	"	A1	Adjust gimmick (A1) for maximum regeneration (below oscillation).
3.	Repeat steps 1 and 2 for maximum gain and sensitivity without oscillation throughout the tuning range.						

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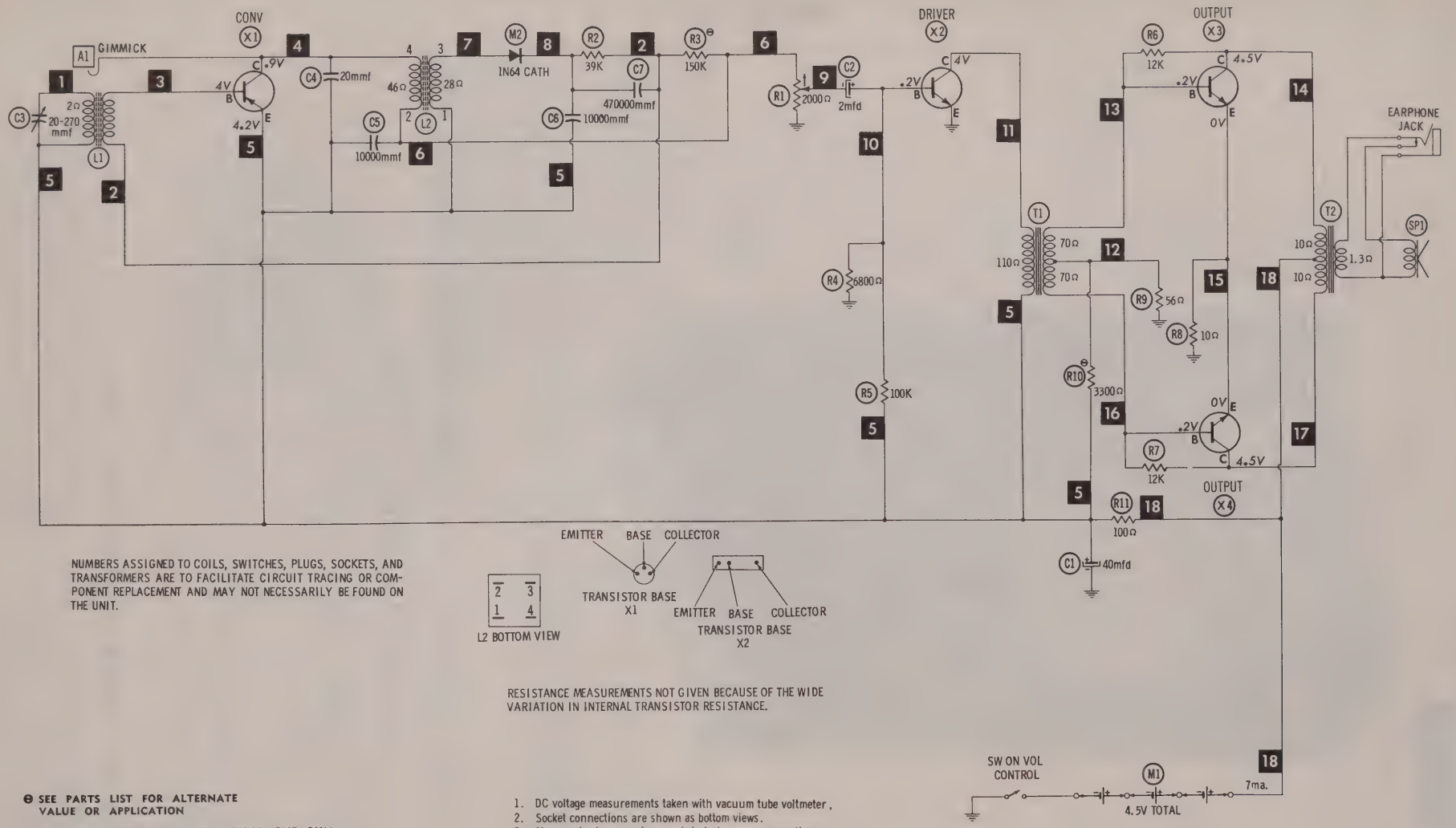
JF360

SET 466 FOLDER 9



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

L2 BOTTOM VIEW

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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with CIRCUITRACE®

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REGENCY MODEL TR-11

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	REGENCY Part No.	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	300-739	Converter					PNP
X2	300-719	Driver					NPN
X3	300-719	Output					NPN
X4	300-719	Output					NPN

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	REGENCY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	40	10	300-473-10	PWE10040	EC50-10	TT15X40	ML40-15	TE-1119	
C2	2	3	300-473-1	PWE3001	EC2-3	TT6X2	ML2-6	TE-1051	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	20-270	#300-670						
C4	20		BPD-00002	DD-200	L10Q2	CCD-200	ZT-542	5GA-Q2
C5	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C6	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C7	470000			UK-474				

Regency Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	REGENCY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2000Ω	1/4	101-310-1					Volume and Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	39K	(120K) *
R3	150K	
R4	6800Ω	
R5	100K	

ITEM No.	RATING	REMARKS
R6	12K	
R7	12K	
R8	10Ω	
R9	56Ω	

ITEM No.	RATING	REMARKS
R10	3300Ω	(2700Ω, 3900Ω, 4700Ω) *
R11	100Ω	

* Alternate.

COILS (RF-IF)

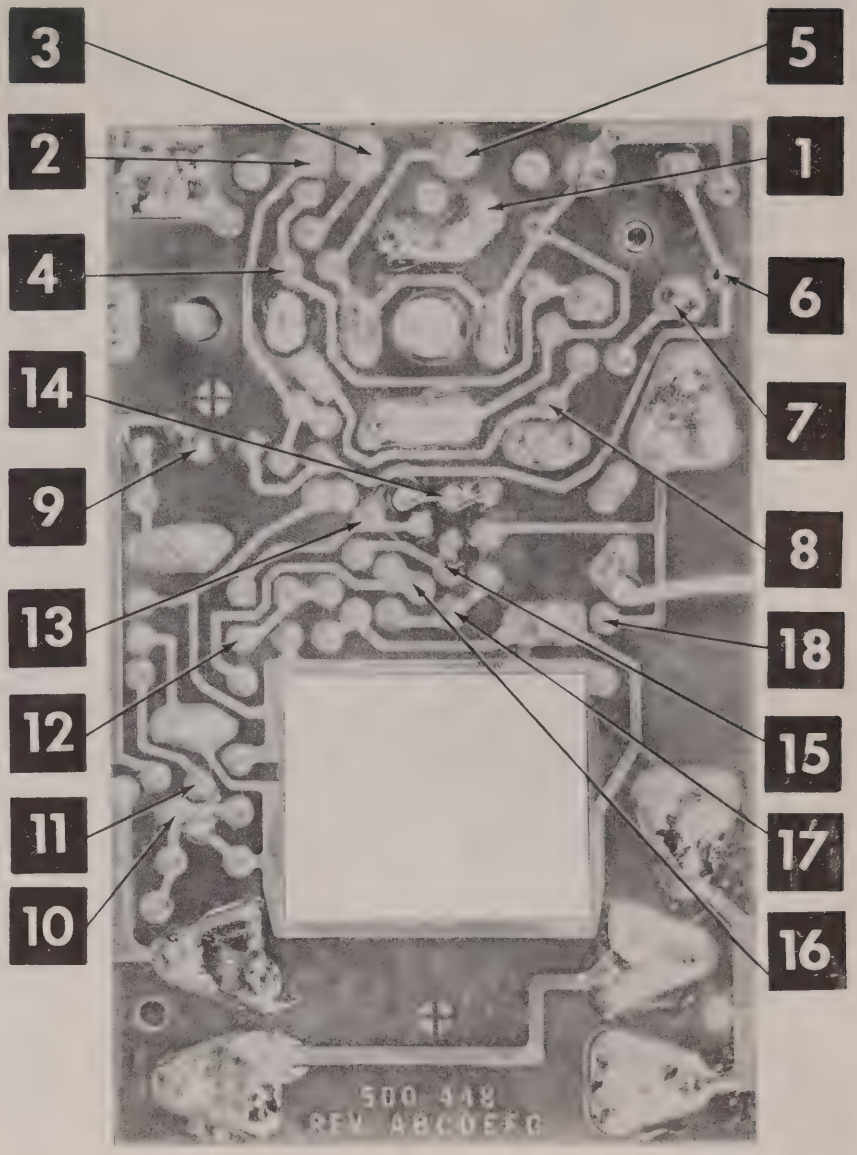
ITEM No.	USE	REPLACEMENT DATA						NOTES
		REGENCY PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	100-740-1						
L2	Det. Trans.	101-028						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	REGENCY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	300-704A						

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	REGENCY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	175Ω CT	12Ω	300-705A				TA-19			

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	REGENCY PART No.	QUAM PART No.	
SP1	2 3/4"	PM	14Ω	300-520		

BATTERIES

ITEM No.	VOLTAGE	REGENCY PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			Z		915		M-15R	Three required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		REGENCY PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N64	1N64	1N64	1N64	1N64	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	REGENCY PART No.	NOTES
	Printed Board	500-448	

CABINETS & CABINET PARTS

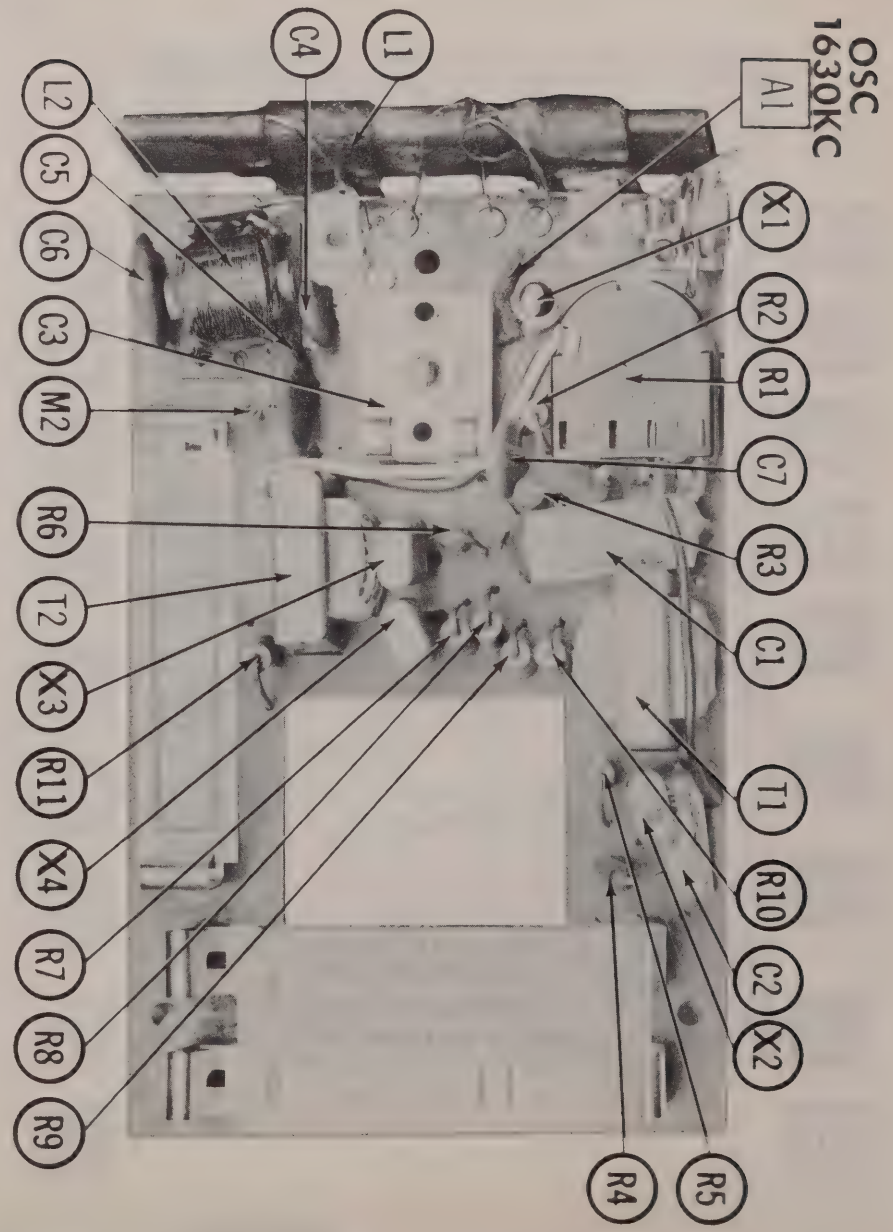
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	300-839	Tuning
Knob	101-304	Volume
Case	600-114	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



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EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 9049, 9051
(Ch. 528.53490, 528.53491)

SILVERTONE MODELS 9049, 9051
(Ch. 528.53490, 528.53491)

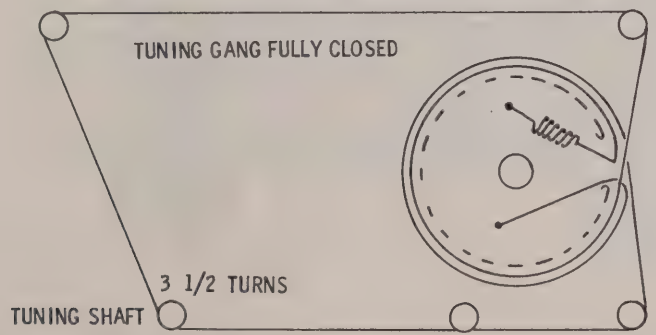
MODEL 9049

SILVERTONE MODELS 9049, 9051
(Ch. 528.53490, 528.53491)

TRADE NAME	Silvertone Models 9049, 9051 (CH. 528.53490, 528.53491)		
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois		
TYPE SET	AC Operated 12 Tube FM-AM Receiver & Stereo Amp. With 4 Speed Automatic Record Changer		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	135 Watts, 1.3 Amp. @117 Volts AC (FM)
TUNING RANGE—BROADCAST	535 — 1620KC	FREQ. MOD.	88 — 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR SILVERTONE 528.56310 — PHOTOFACT SET 417 FOLDER 10

DIAL CORD STRINGING



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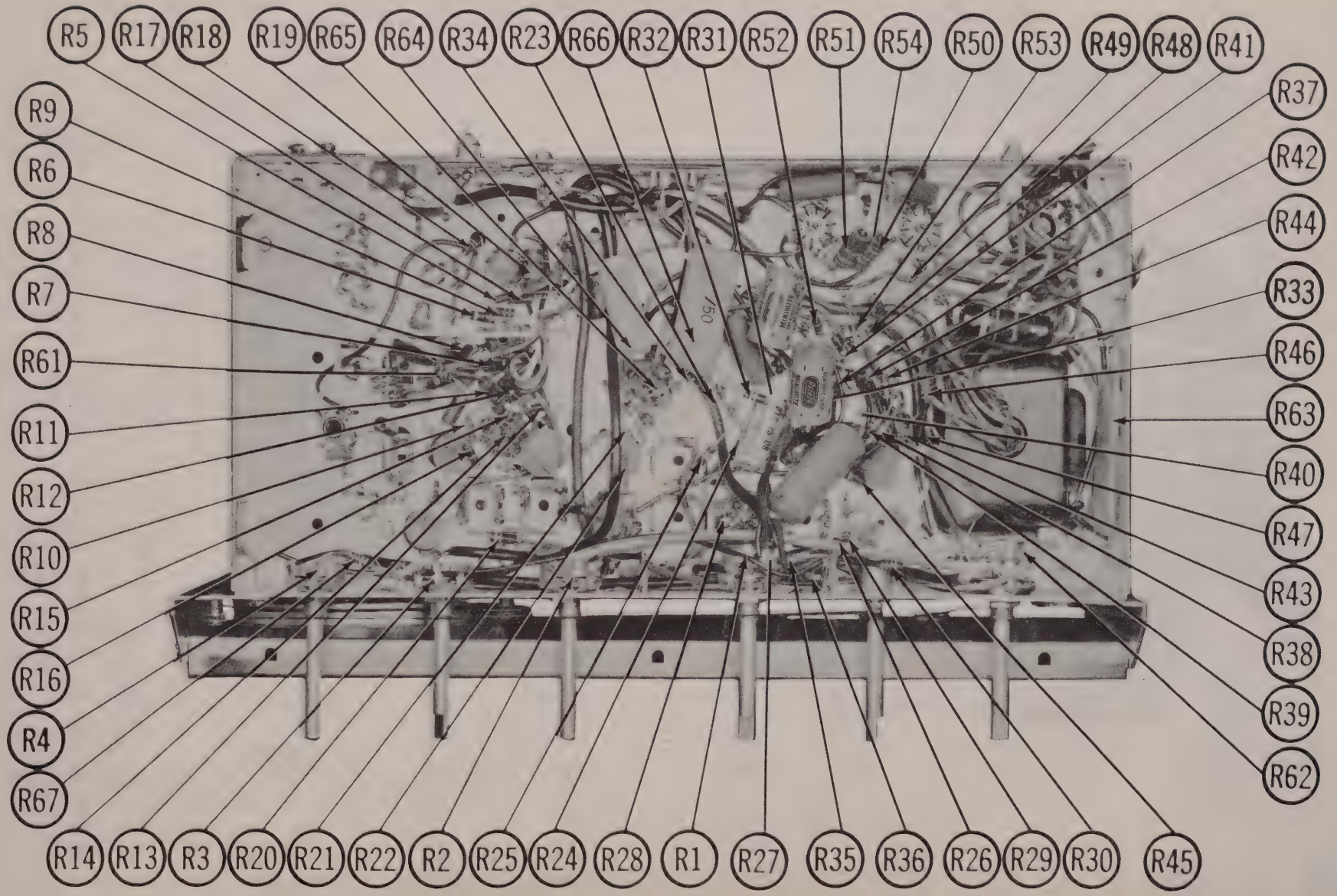
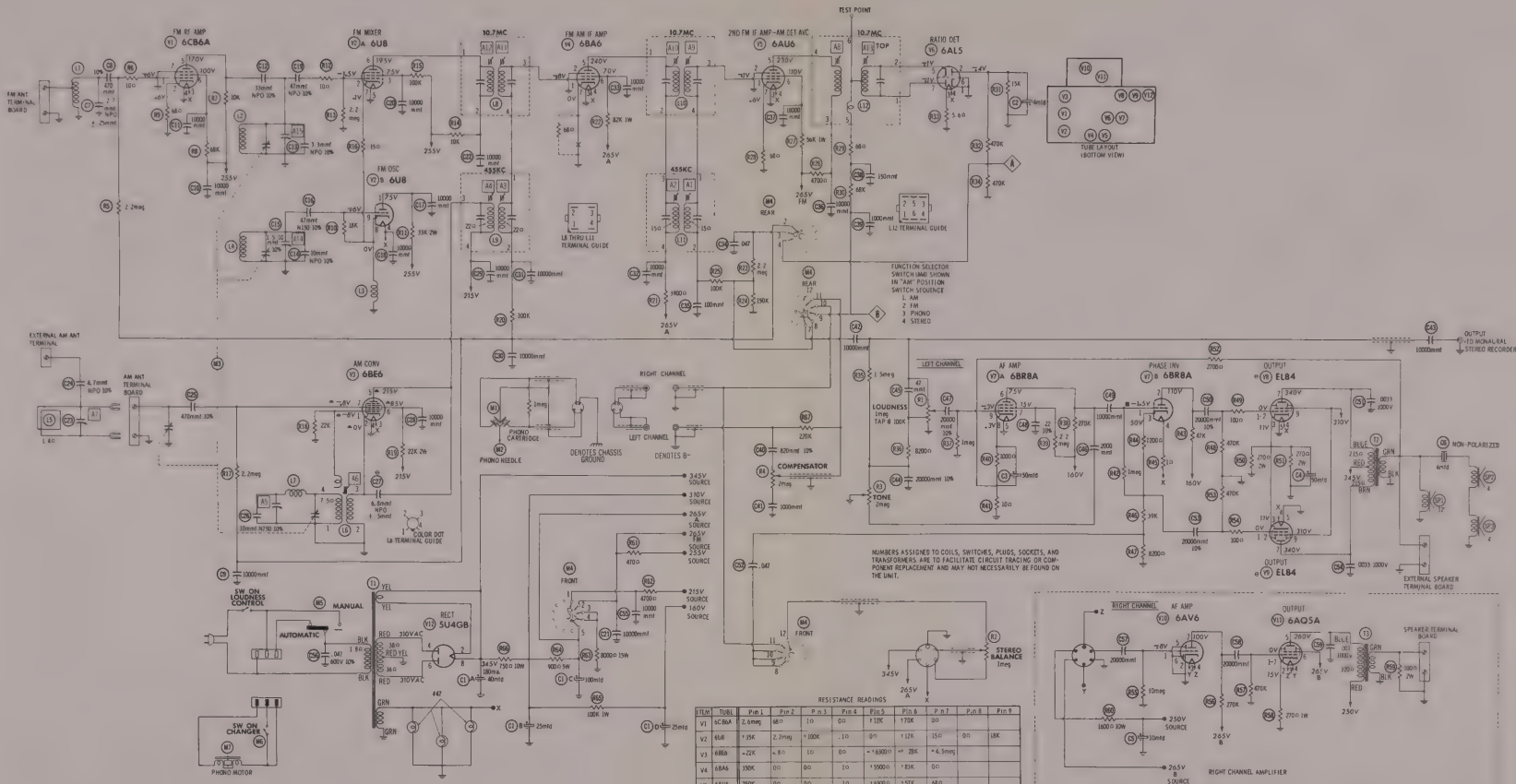


CHASSIS BOTTOM VIEW - RESISTOR IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6A	2.6meg	68Ω	1Ω	0Ω	+12K	170K	0Ω		
V2	6U8	†35K	2.2meg	†100K	.1Ω	0Ω	†12K	15Ω	0Ω	18K
V3	6BE6	∞22K	∞8Ω	1Ω	0Ω	+*6300Ω	+* 28K	*4.5meg		
V4	6BA6	350K	0Ω	0Ω	1Ω	†5500Ω	†83K	0Ω		
V5	6AU6	250K	0Ω	0Ω	.1Ω	†6300Ω	†57K	68Ω		
V6	6AL5	0Ω	15K	2Ω	.1Ω	1MΩ	0Ω	1MΩ		
V7	6BR8A	1meg	†165K	68K	1.1Ω	0Ω	†370K	12.3meg	100Ω	1meg
V8	EL84 6BQ5	470K	470K	135Ω	.1Ω	0Ω	NC	†215Ω	NC	†75Ω
V9	EL84 6BQ5	470K	470K	135Ω	.1Ω	0Ω	NC	†215Ω	NC	†75Ω
V10	6AV6	33meg	0Ω	1Ω	0Ω	0Ω	0Ω	†270K		
V11	6AQ5A	470K	270Ω	0Ω	.1Ω	†2000Ω	†1600Ω	470K		
V12	5U4GB	NC	¶	NC	38Ω	NC	15Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
- MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 8 OF V12.
* MEASURED FROM PIN 3 OF V7 NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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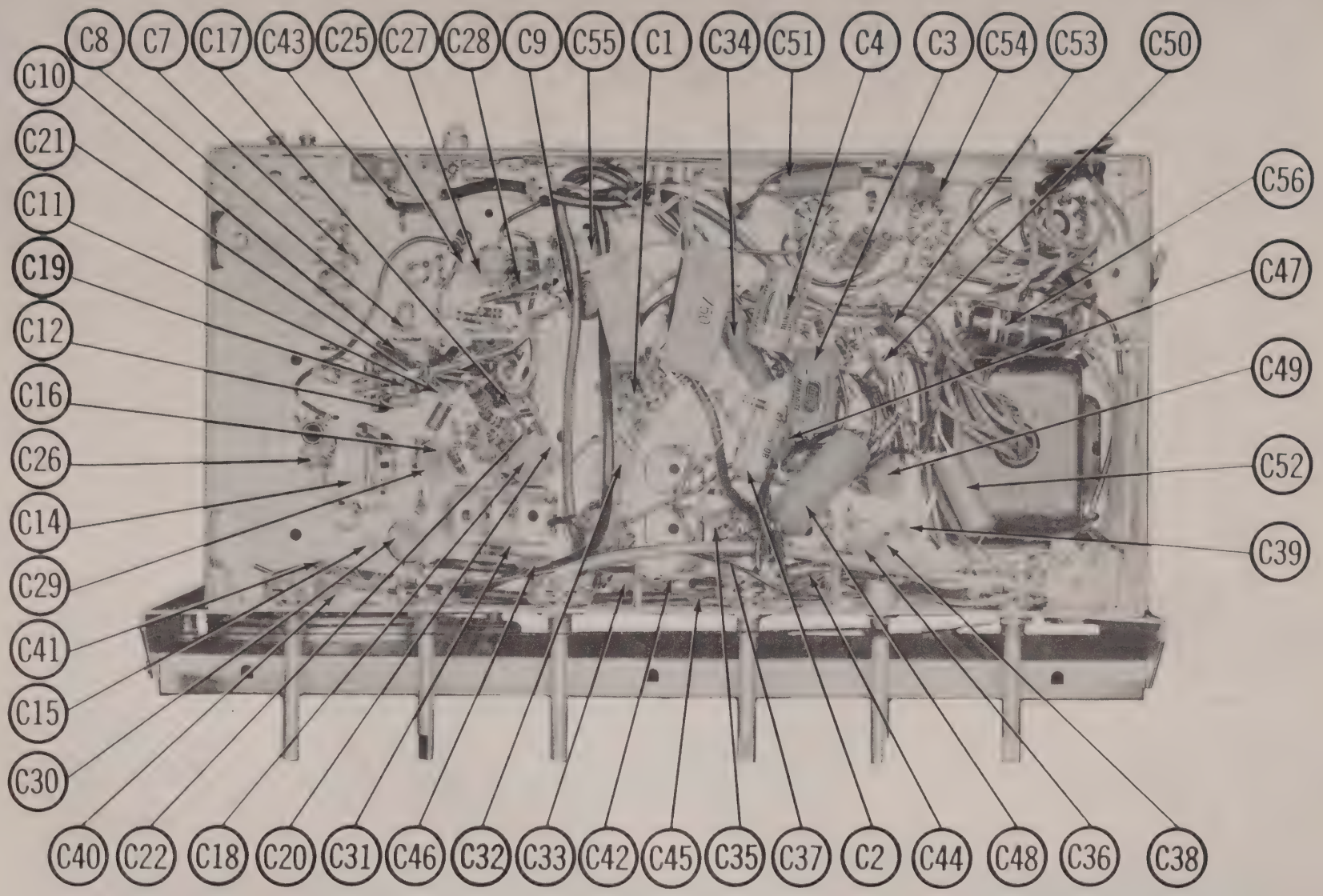
SILVERTONE MODELS 9049, 9051
(Ch. 528.53490, 528.53491)



CHASSIS BOTTOM VIEW - CAPACITOR IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loudness control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Set tone controls to mid-range.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.
Suggested alignment tools:
A1, A2.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A3, A4, A8 thru A13.....GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A7, A14, A15.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6.....GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd.	High side to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	"	A5	"
3.	"	"	535KC	"	Tuning gang fully closed	"	A6	Adjust for maximum output. Repeat Steps 2 & 3.
4.		Loop	1400KC	AM	1400KC	Across voice coil	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.		High side to ungrounded tube shield floating over Mixer-Osc. (V2). Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe to point (A). Common to chassis.	A8, A9, A10, A11 A12	Adjust for maximum deflection.
6.		"	"	"	"	DC probe to point (A). Common to point (B).	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.		High side to ungrounded tube shield floating over Mixer-Osc. (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. amp to point (A). Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizing cap. (C2). Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.		"	"	"	"	Vert. amp. to point (B). Low side to chassis.	A13	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
7.	300Ω Carbon Resistor	High side to FM antenna terminal. Low side to chassis.	108.4MC (400∿ FM)	FM	Tuning gang fully open	Across voice coil	A14	Adjust for maximum output.
8.	"	"	87.6MC	"	Tuning gang fully closed	"	L4	Adjust for maximum output. Repeat Steps 7 & 8 until no further change occurs.
9.	"	"	104MC	"	104MC	"	A15	Adjust for maximum output.
10.	"	"	98MC	"	98MC	"	L1	"
11.	"	"	90MC	"	90MC	"	L2	"

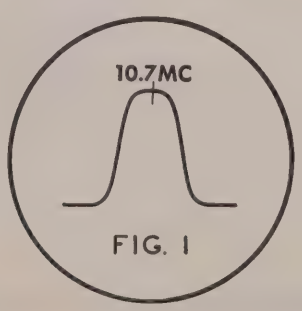


FIG. 1

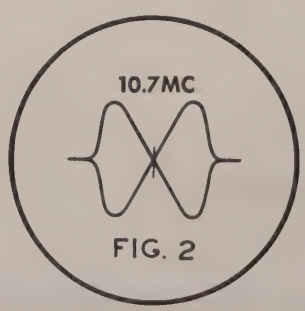
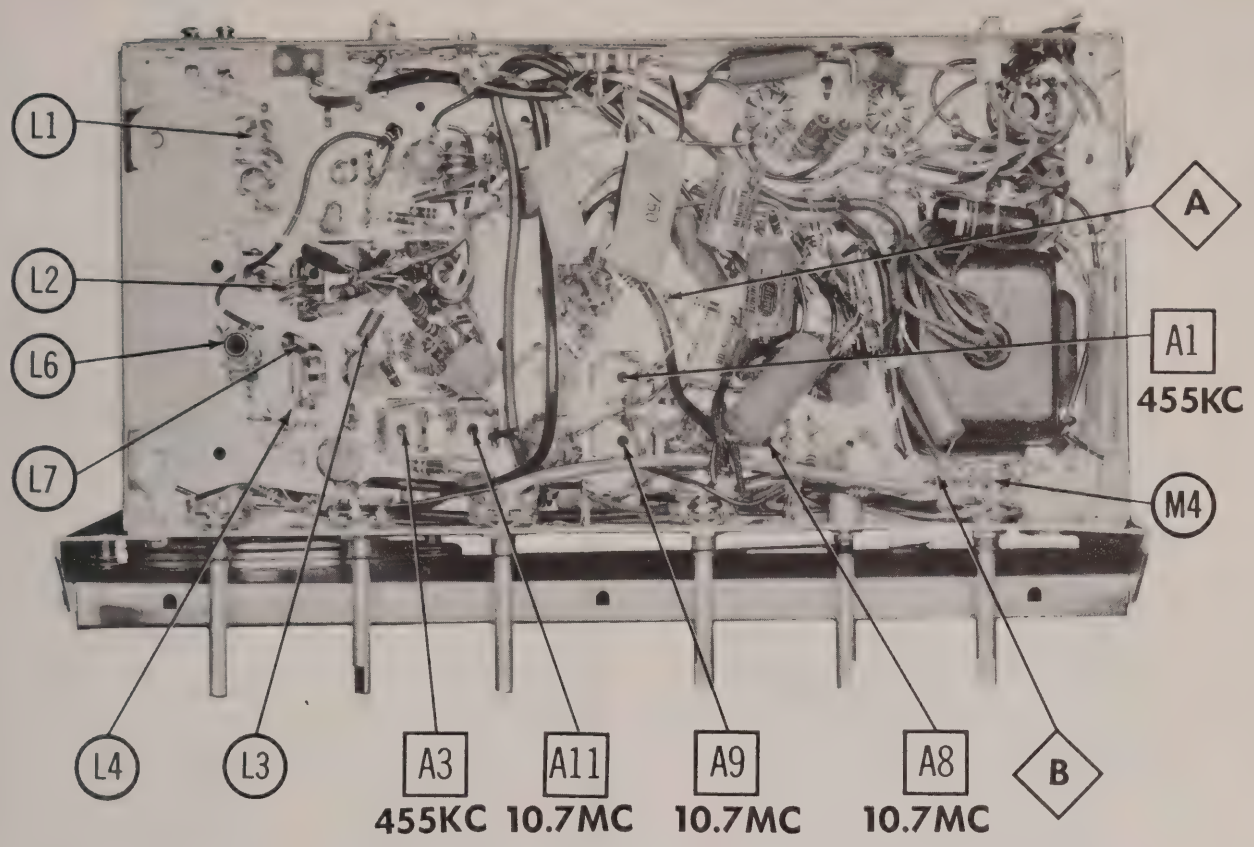
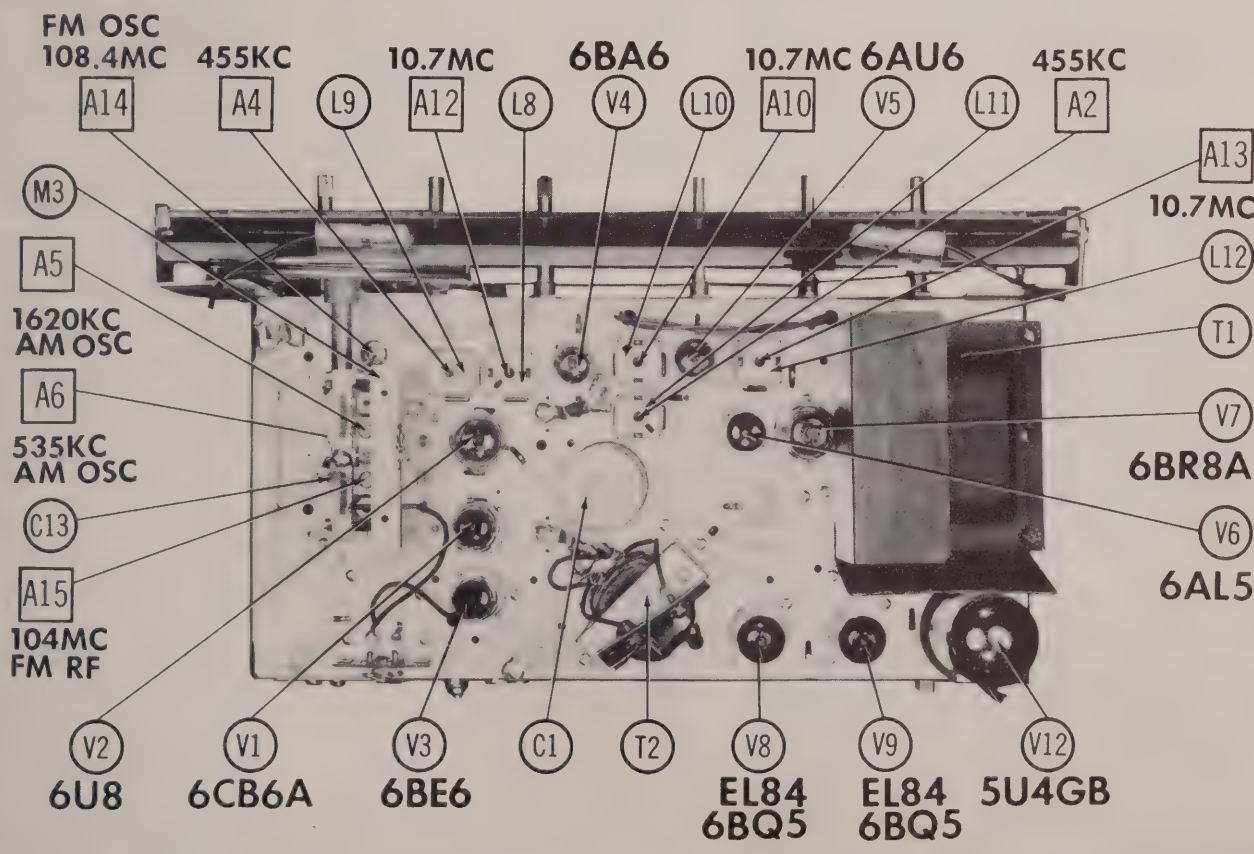


FIG. 2



CHASSIS BOTTOM VIEW - ALIGN, INDUCTOR, & MISC IDENT.



CHASSIS - TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	FM RF Amplifier	6CB6A
V2	FM Mixer-FM Osc.	6U8
V3	AM Converter	6BE6
V4	FM-AM IF Amp.	6BA6
V5	2nd FM IF Amp. -AM Det. AVC	6AU6
V6	Ratio Detector	6AL5
V7	Left Channel AF Amp. - Left Channel Phase Inv.	6BR8A
V8	Left Channel Output	EL84/6BQ5
V9	Left Channel Output	EL84/6BQ5
V10	Right Channel AF Amp.	6AV6
V11	Right Channel Output	6AQ5A
V12	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	40	350	18-35-3	AFH4-05-70	C0374	FP420.39	TMQ-119	TVL-3843	
B	25	350			BR10035		TD-100-450	TVA-1718	
C	100	350							
D	25	350							
C2	4	50	18-25-0	PRS150V4	BBR4-50	TT50X4	TD-4-50	TE-1302.1	
C3	50	25	18-23-0	PRS25V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C4	50	25	18-23-0	PRS25V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C5	10	350	18-38-0	PRS350V10	BR1045	TC62	TD-10-450	TVA-1604	
C6	4	150	18-9-5	NP-PRS450V4	BBR8-150 †	TCN510		TE-1403 †	

† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	2.7		NPO +.25mmf	15-279121					5TCCB-V27S+.25mmf*	
C8	470		10%	15-47111	DI-470	D6-471		JL-347	5GA-T47S 10%*	
C9	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	33		NPO 10%	15-330611	NPO-SI 33	TCZ-33	C10Q33C	ZT-5433	5TCC-Q33S 10%*	
C13	3.3		NPO 10%	15-339131	NPO-DI 3.3	DTZ-3R3	C10V33C	CNO-533	5TCC-V33S 10%*	
C14	10		NPO 10%	20-125-0	NPO-SI 10	TCZ-10	C10Q1C	CNO-410	5TCC-Q1S 10%*	
C15	1.5-10		10%	19-2-5		829-10				

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C16	47		N150 10%							
C17	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C18	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C19	47		NPO 10%	15-470611	NPO-SI 47	TCZ-47	C10Q47C	CNO-447	5TCC-Q47S 10%*	
C20	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C21	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C22	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C23				19-165-0						
C24	4.7		NPO 10%	20-23-0	NPO-SI 4.7	TCZ-4R7	C10V47C	ZT-5547	5TCC-V47S 10%*	
C25	470		10%	15-47111	DI-470	D6-471		JL-347	5GA-T47S 10%*	
C26	10		N750 10%	15-100614	N750-SI 10	TCN-10	C10Q1U	CN7-410	5TCU-Q1S 10%*	
C27	6.8		NPO ±.5mmf	15-689131		DTZ-6R8			5TCCB-V68S ±.5mmf*①	
C28	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C29	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C30	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C32	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C33	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C34	.047	200		16-47348	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C35	100			15-10116	BPD-0001	DD-101	L10T1	CNO-310	5GA-T1	
C36	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C37	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C38	150			15-15111	BPD-00015	DD-151	L10T15	B-315	5GA-T15	
C39	1000			15-10216	BPD-001	DD-102	BYA10D1	UC-521	5HK-D1	
C40	820		10%	15-82111				JL-382	5GA-T82S 10%	
C41	1000			15-10216	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C42	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C43	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C44	20000		10%	15-20316					5GA-S2S 10%*	
C45	47			15-47011	BPD-00004	DD-470	L10Q47	CNO-447	5GA-Q47	
C46	2000			15-20211	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C47	20000		10%	20-142-0					5GA-S2S 10%*	
C48	.22	400	10%	16-22448	V84C4P22		PM4P22	GEM-4022	4TM-P22	
C49	10000			15-10316	BPD-01	DD-103	DD-103	B-110	5HK-S1	
C50	20000		10%	15-20316					5GA-S2S 10%*	
C51	.0033	1000		16-33268	P1088N-0033	DD-332	CUB10D33	GEM-16233		
C52	.047	400		16-47328	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C53	20000		10%	15-20316					5GA-S2 10%*	
C54	.0033	1000		16-33268	P1088N-0033	DD-332	CUB10D33	GEM-1023	10TM-D3	
C55	10000			15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C56	.047	600	10%	20-647-1	V84C6S47		PM6S47	GTM-6147	6TM-S47	
C57	20000			15-20317	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C58	20000			15-20317	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C59	.001	1000		16-10268	P1088N-001	DD-102	CUB10D1	GEM-1021	10TM-D1	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 22mmf NPO in this application (Part #22011).

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	24-315-0	BT-7417	A47F3-1meg	Q18-137X	RU16T15	Loudness, Tap ⓐ 100K
B	Shaft			Not Req.	FS-3	Not Req.	SL3500	
C	Switch			KR-1	SWE-12	76-1	US42	Off-On
D	Bushing			Not Req.	Not Req.	Not Req.	SL-38	
R2A	1meg	½	24-324-0	B-744	A47-1meg-Z	Q13-137	U53	Stereo Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	2meg	½	24-174-2	B-75	A47-2meg-S	Q11-139	U56	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	2meg	½	24-6-3	B-75	A47-2meg-S	Q11-139	U56	Compensator
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R5	2.2meg		60-22502	
R6	10Ω		60-10001	
R7	10K		60-10301	
R8	68K		60-68301	
R9	68Ω		60-68001	
R10	18K		60-18301	
R11	33K	2		
R12	10Ω		60-10001	
R13	2.2meg		60-22502	
R14	10K		60-10301	
R15	100K		60-10401	
R16	15Ω		60-15001	
R17	2.2meg		60-22502	
R18	22K		60-22301	
R19	22K	2		
R20	100K		60-10401	
R21	3900Ω		60-39201	
R22	82K	1	60-82311	
R23	2.2meg		60-22502	
R24	150K		60-15401	
R25	100K		60-10401	
R26	4700Ω		60-47201	
R27	56K	1	60-56311	
R28	68Ω		60-68001	
R29	68Ω		60-68001	
R30	68K		60-68301	
R31	15K		60-15301	

ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R32	470K		60-47401	
R33	5.6Ω		60-56901	
R34	470K		60-47401	
R35	1.5meg		60-15502	
R36	8200Ω		60-82201	
R37	1meg		60-10501	
R38	270K		60-27401	
R39	2.2meg		60-22502	
R40	1000Ω		60-10201	
R41	10Ω		60-10001	
R42	1meg		60-10501	
R43	47K		60-47301	
R44	1200Ω		60-12201	
R45	1Ω		60-10901	
R46	39K		60-39301	
R47	8200Ω		60-82201	
R48	470K		60-47401	
R49	100Ω		60-10101	
R50	270Ω	2	60-27121	
R51	270Ω	2	60-27121	
R52	2700Ω		60-27201	
R53	470K		60-47401	
R54	100Ω		60-10101	
R55	10meg		60-10602	
R56	270K		60-27401	
R57	470K		60-47401	
R58	270Ω	1	60-27111	

RESISTORS (cont)

ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R59	100Ω	2	60-10121	
R60	1600Ω	10	61-131-0	
R61	470Ω		60-47101	
R62	4700Ω		60-47201	
R63	8000Ω	15	61-136-0	

ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R64	900Ω	5	61-17-0	
R65	100K	1	60-10411	
R66	750Ω	10	61-128-0	
R67	220K		60-22401	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil	10-144-1						
L2	FM RF Coil	10-145-1						
L3	RF Choke	10-129-1				4588		.55uh
L4	FM Osc. Coil	10-3-3						
L5	Loop Ant.	82-9-1						
L6	AM Osc. Coil	10-46-4						
L7	RF Choke	10-129-1				4588		.55uh
L8	1st FM IF Trans.	10-44-2	16-3487	16-3487	FM-254	1463		
L9	1st AM IF Trans.	10-101-2	16-6758	16-6758	BC-352	12-C1	RF-1	
L10	2nd FM IF Trans.	10-44-2	16-3487	16-3487	FM-254	1463		
L11	2nd AM IF Trans.	10-45-2	16-6758	16-6758	BC-353	12-C2	RF-2	
L12	Ratio Detector	10-15-0	17-3498	17-3498	FM-255	1465		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ 1.3A	620 VCT ⓐ .180A	5V ⓐ 3A	80-24-0						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ⓐ 4.8A									

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5300Ω CT	6-8Ω	80-65-1	24S55	A-2904①	AU-609	A-3870	24S55	S-55X	① Drill New Mounting Hole
T3	5000Ω	6-8Ω	80-74-1	26S46	A-2904	AU-604	A-3337	26S46	S-53X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: SILVERTONE PART No.	QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	33-378-4	12A6AZ7.8	
SP2	4"	PM	3-4Ω	33-362-4	4A15TZ4.1	
SP3	4"	PM	3-4Ω	33-362-4	4A15TZ4.1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1	33-311-0	13-TB *						* Includes needle & mounting mechanism

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	83-1250 (78)	E98 † or E98D ♦	* W101STD ♦ or * W101STS † or * W102S †	* Includes cartridge † Jewel ♦ Diamond
	83-1251 (LP)	E98X † or E98XD ♦		

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuning Cap	19-4-4	4 Gang (AM Ant. 5 — 420mmf, Osc. 9 — 135mmf)
M4	Switch	69-272-0	Function Selector
M5	Switch	69-269-0	Manual-Auto, Slide Type
M6	Switch	84-6552	Off-On (Changer)
M7	Motor	59-72	Complete, Chassis 528.56580
	Motor	59-89	Complete, Chassis 528.56590

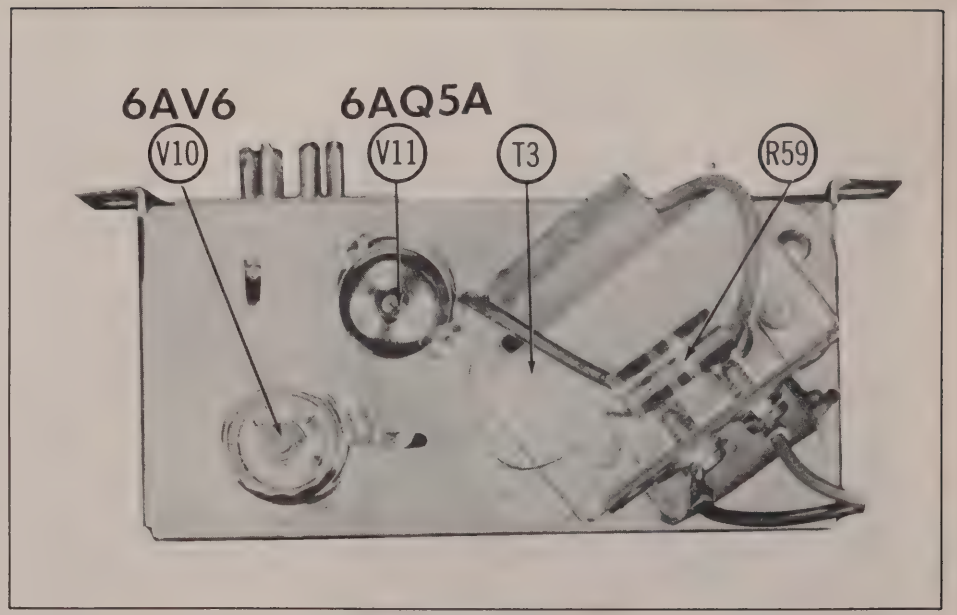
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

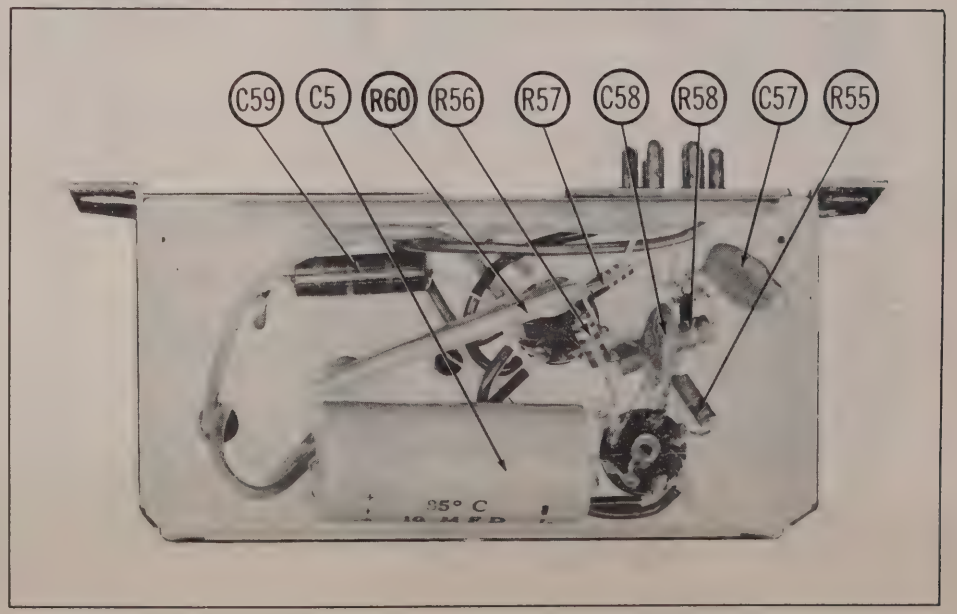
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS TOP VIEW RIGHT CHANNEL



CHASSIS BOTTOM VIEW RIGHT CHANNEL



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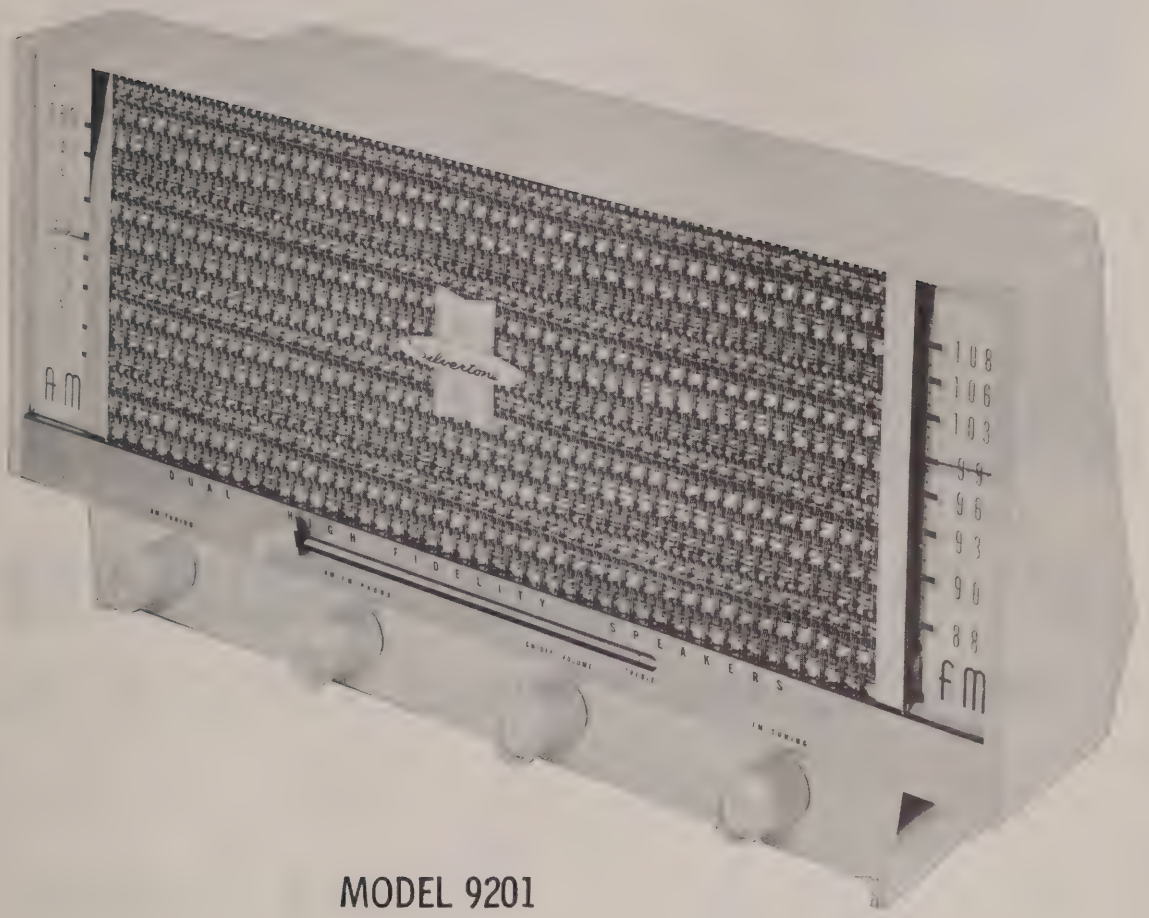
SILVERTONE MODELS 9200, 9201 (Ch. 132.44900)

SILVERTONE MODELS
9200, 9201 (Ch. 132.44900)



MODEL 9201

SILVERTONE MODELS
9200, 9201 (Ch. 132.44900)

TRADE NAME	Silvertone Models 9200, 9201 (Ch. 132.44900)	
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois	
TYPE SET	AC Operated 6 Tube FM-AM Receiver	
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING 39 Watts, .39 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	530-1650KC	FREQ. MOD. 88-108MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JK266

SET 466 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	12DT8	V5	Ratio Det. -AM Det. -AVC-AF Amp.	19T8
V2	1st FM IF Amplifier	12BA6	V6	Output	50C5
V3	AM Converter	12BE6			
V4	2nd FM-1st AM IF Amplifier	12BA6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■70	150	43711-4	AFH3-81-50	C0600 ‡	PFP311.12		PCL-3432	
B	▲30	150							
C	20	25							
C2	4	50	45238-1	BCD-50004	ECPB804	TT50X4	ML4-50	VL-1303	

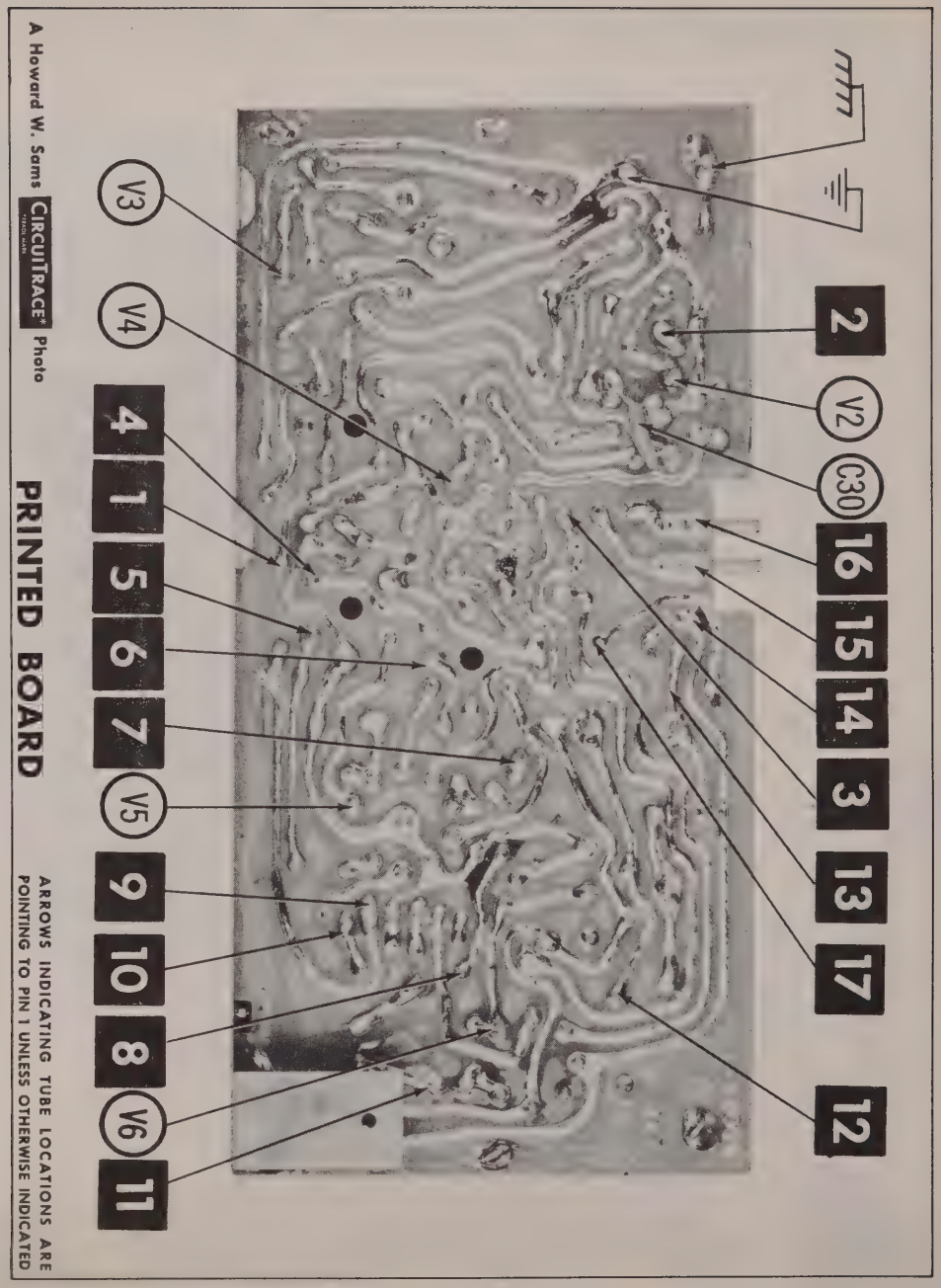
‡ Use printed circuit adaptors #55277 and 55278.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	2000	1400		41135-202	HVD-15-2000	DD30-202	HVC20D2	2HV-2200	20HKB-D2S *	
C4	2000	1400		41135-202	HVD-15-2000	DD30-202	HVC20D2	2HV-2200	20HKB-D2S *	
C5	2000	1400		41135-202	HVD-15-2000	DD30-202	HVC20D2	2HV-2200	20HKB-D2S *	
C6	10				SI 10	D6-100	L10Q1	UC-541	5GA-Q1	
C7										
C8	1000				SI 1000	D6-102	L10D1	UC-521	5HK-D1	
C9	1000				SI 1000	D6-102	L10D1	UC-521	5HK-D1	
C10	20				SI 20	D6-200	L10Q2	ZT-542	5GA-Q2	
C11	20				SI 20	D6-200	L10Q2	ZT-542	5GA-Q2	
C12										
C13	15				SI 15	D6-150	L10Q15	UC-5415	5GA-Q15	
C14	68				SI 68	D6-680	L10Q68	UC-5468	5GA-Q68	
C15	8.2				NPO-SI 8.2		C10V82C			
C16	10				SI 10	D6-100	L10Q1	UC-541	5GA-Q1	
C17	20000			43674-17	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C18	180		N470							①
C19	4700			43674-6	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C20	50000			43674-11	BPD-05	DD-503	H-05S5	BT-150	5HK-S5	
C21	15			43957-10	BPD-000015	DD-150	L10Q15	CNO-415	5GA-Q15	
C22	20000			43674-2	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C23	150		N2200	43957-2						
C24	2200			43674-4	BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C25	10000			43674-1	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C26	20000			43674-2	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C27	560			43674-12	DI-560	DD-561	L10T56	B-356	5GA-T56	
C28	560			43674-12	DI-560	DD-561	L10T56	B-356	5GA-T56	
C29	4700			43674-1	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C30	560			43674-12	DI-560	DD-561	L10T56	B-356	5GA-T56	②
C31	20000			43674-2	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 470mmf in this application (Part #43674-11).
② Not used in some versions.



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	44500-10				PP55A	Volume
B	Switch						Not Req.	Push-Pull Off-On
R2A	1meg	½	44500-11	B-68		Q17-137	RU16R	Tone
B	Bushing			Not Req.		Not Req.	SL-38	
C	Shaft			Not Req.		Not Req.	SL-3500	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	1meg	
R4	10K	
R5	2200Ω 1W	
R6	2.2meg	
R7	18meg	
R8	330Ω	

ITEM No.	RATING	REMARKS
R9	22K	
R10	1meg	
R11	330Ω	
R12	82Ω	
R13	180Ω	
R14	47K	

ITEM No.	RATING	REMARKS
R15	1000Ω 5W	
R16	47Ω 5W	
R17	1000Ω 10W	
R18	330K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA	
K1	FM Detector Load & Coupling	100mmf, 100mmf, 3300mmf, 150Ω, 15K, 39K	45228		
K2	Audio Coupling	125mmf, 125mmf, 220mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	43743-2	Aerovox Centralab Sprague	PA-512-3 PC-158 DT-5

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	45534-9						
L2	AM Osc. Coil	43644-1						
L3	2nd FM IF Trans.	45241-1						
L4	1st AM IF Trans.	44282-1	16-6780	16-6780	BC-356	13-PC9	RF-4	
L5	Ratio Detector	45240-2	17-3492	17-3492		1465-PC		
L6	2nd AM IF Trans.	44282-1	16-6780	16-6780	BC-357	13-PC10	RF-4	
L7A	Line Choke	24308-2						
B	Line Choke							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2000Ω tap @ 6%	3-4Ω	43393-4	24S50A	A-3031		A-3336	24S50A	S-16X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	5"	PM	6-7Ω	43365-2	5A1Z6.4	
SP2	5"	PM	3-4Ω	45599-2	5A07	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SILVERTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.066A	44465-3 ①	1101A ①	RS100A ①	100AS ①	SR200 ②	① Selenium Type. ② Silicon Type.

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M2	Tuning Cap.	46169	2 Gang
M3	Tuner Unit	46134	FM
M4	Switch	46165	Function Selector

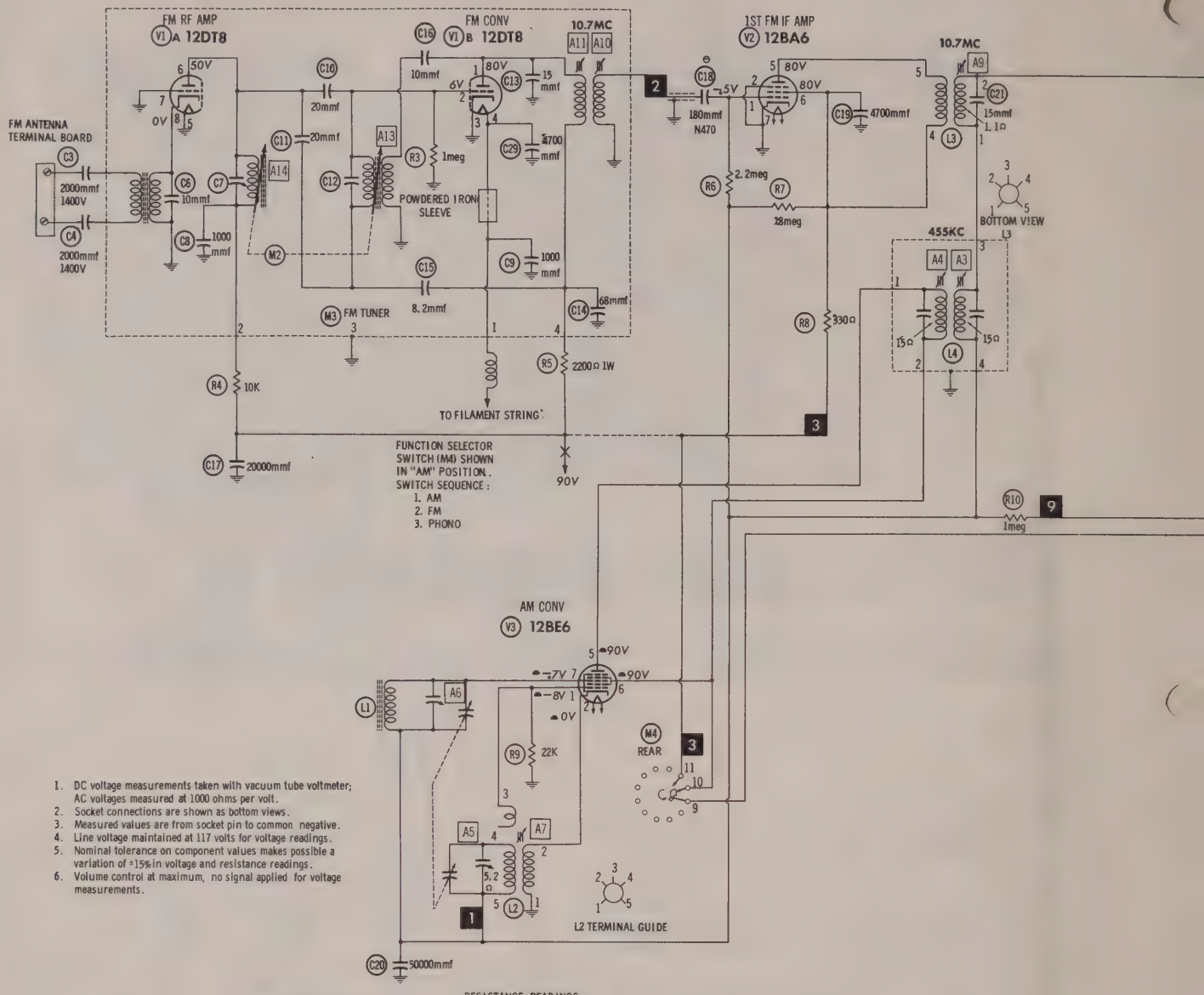
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	45989-17	Ivory, Model 9201
Knob	45989-48	Brown, Model 9200
Knob	46145-17	Tone Lever, Ivory, Model 9201
Knob	46145-48	Tone Lever, Brown, Model 9200
Cabinet Front Ass'y.	46489-17	Ivory, Model 9201
Cabinet Front Ass'y.	46489-48	Brown, Model 9200
Cabinet Back Ass'y.	45936-17	Ivory, Model 9201
Cabinet Back Ass'y.	45936-48	Brown, Model 9200
Dial Glass	45939	AM
Dial Glass	45938	FM
Pointer	46082-1	FM-AM
Pointer	46083-1	Tone

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type) ..... Use BELDEN No. 8874
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DT8	†3200Ω	1meg	0Ω	12Ω	0Ω	†11K	0Ω	.1Ω	0Ω
V2	12BA6	3.2meg	0Ω	55Ω	43Ω	†1600Ω	†1600Ω	0Ω		
V3	12BE6	22K	.4Ω	43Ω	31Ω	-†1300Ω	-†1300Ω	-1.5meg		
V4	12BA6	1meg	0Ω	55Ω	67Ω	†1300Ω	†1300Ω	82Ω		
V5	19T8	530K	15K	530K	31Ω	12Ω	540K	0Ω	6.8meg	†470K
V6	50C5	150Ω	470K	67Ω	120Ω	470K	†1000Ω	†150Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM OUTPUT OF M1.
- MEASURED IN "AM" POSITION.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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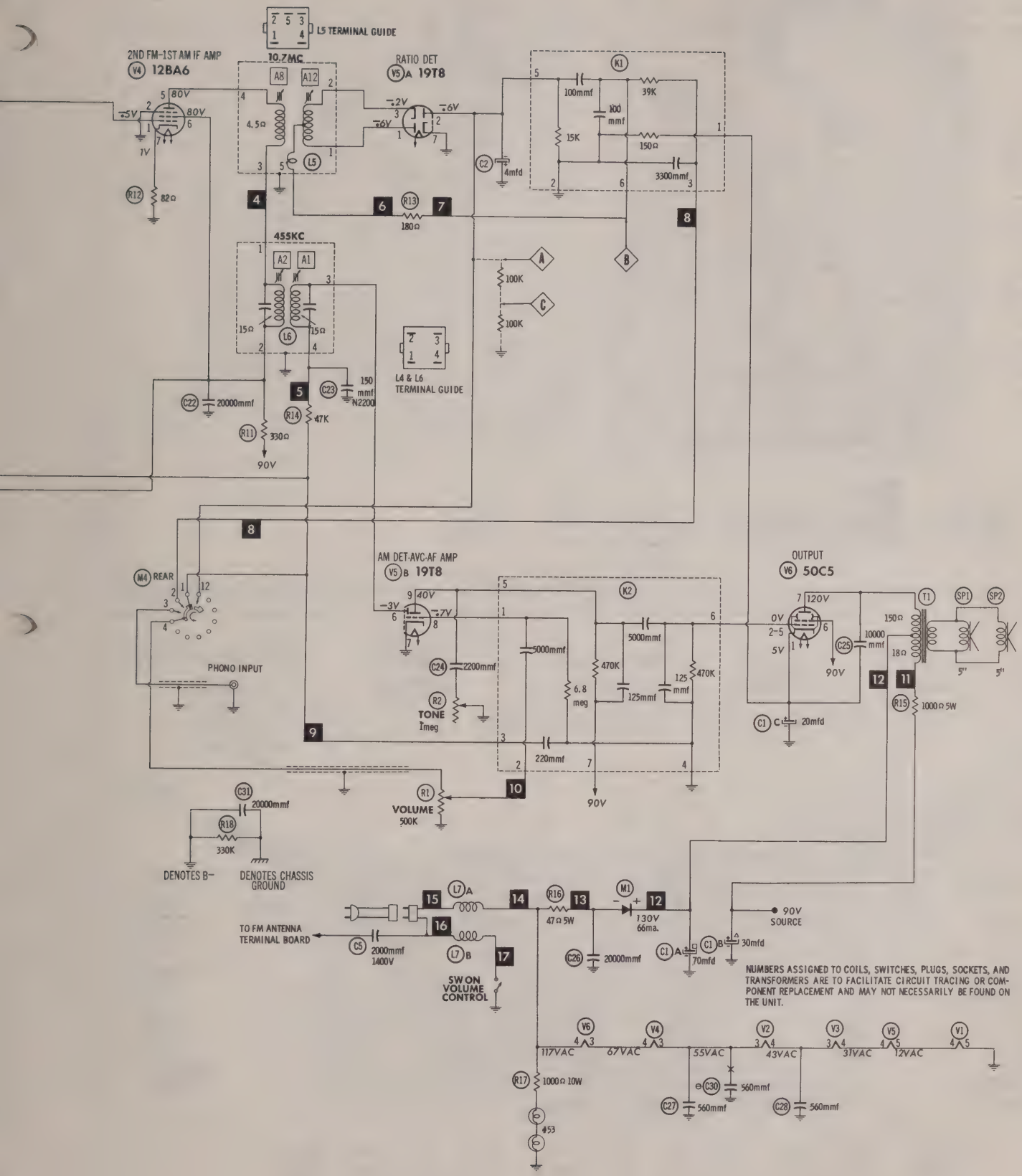
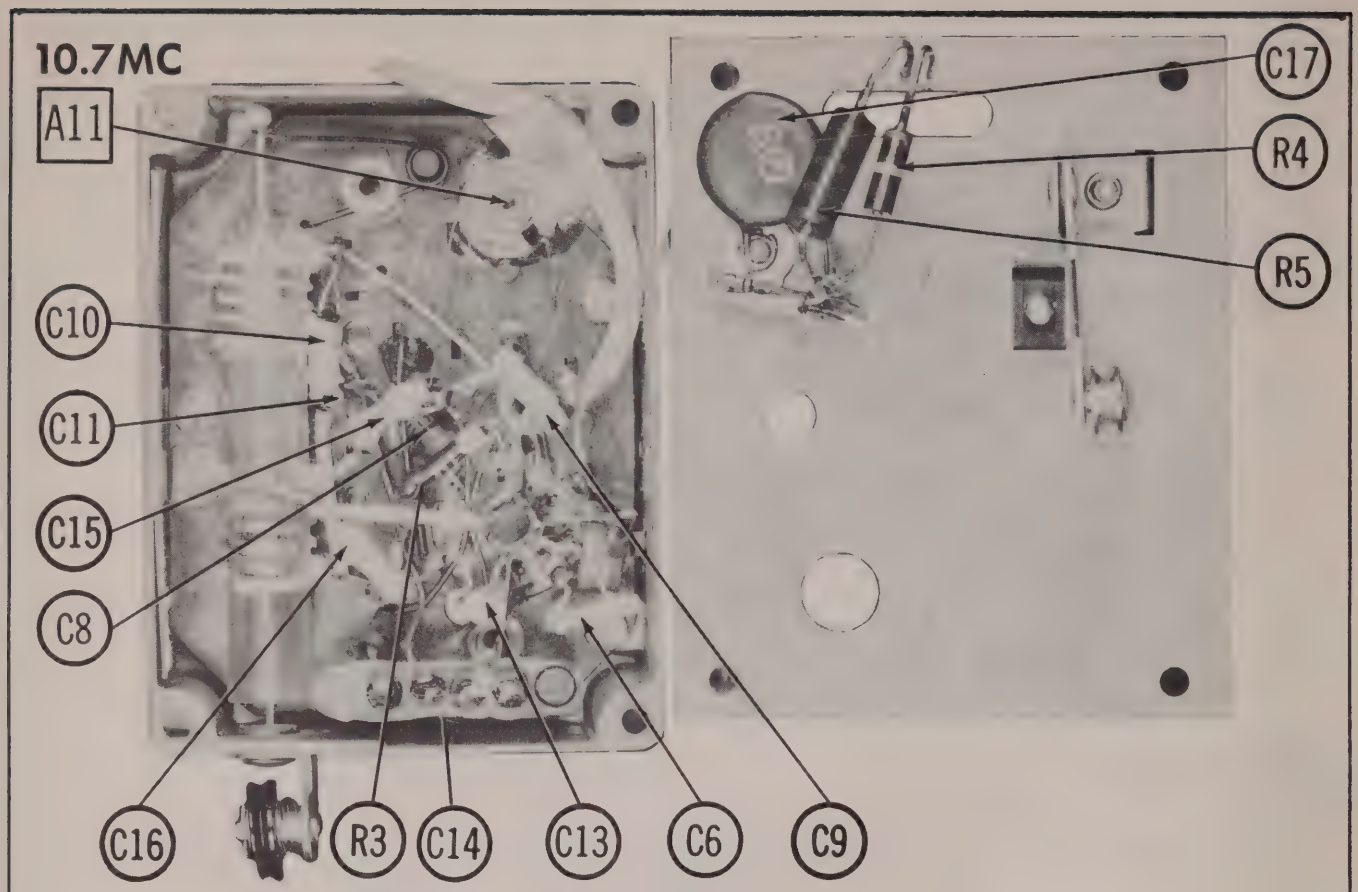
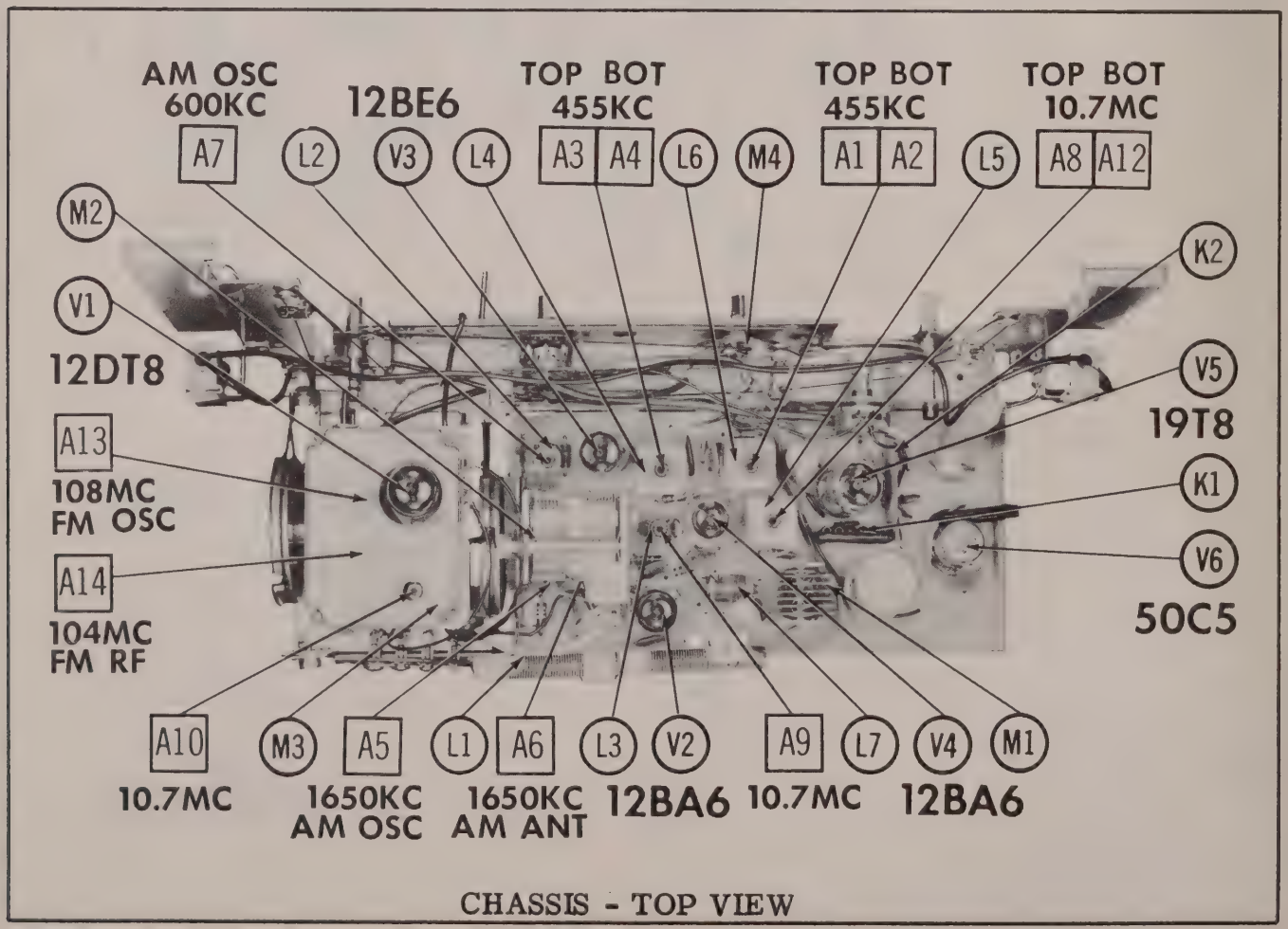


SILVERTONE MODELS
9200, 9201 (Ch. 132.44900)



FM RF SUBCHASSIS



CHASSIS - TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: Al thru A4, A7 thru Al2 ..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6, Al3, Al4 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna stator lug of tuning gang. Low side to B-.	455KC (400∿ Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	Loop	1650KC	"	"	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	"	600KC	"	A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓐ to B-. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.		High side to ungrounded tube shield floating over Mixer-Osc. tube (V1). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point Ⓐ. Common to B-.	A8, A9, A10, A11	Adjust for maximum deflection.
5.		"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.		Place a thin insulated metal strip between the Mixer-Osc. tube (V1), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to B-.	A8, A9, A10, A11	Disconnect stabilizing capacitor (C2). Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown.
5.		"	"	"	"	Vert. Amp. to point Ⓑ. Low side to B-.	A12	Reconnect C2. Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	270Ω Carbon Resistors	Across FM antenna terminals with 270Ω in high side.	108MC (Unmod)	FM	108MC	DC probe to point Ⓐ. Common to B-.	A13	Adjust for maximum deflection.
7.	"	"	104MC	"	104MC	"	A14	"

FIG. 1

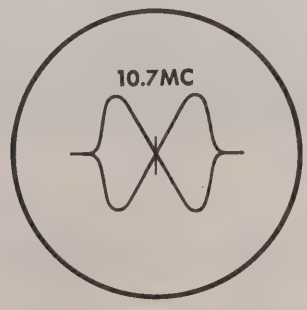
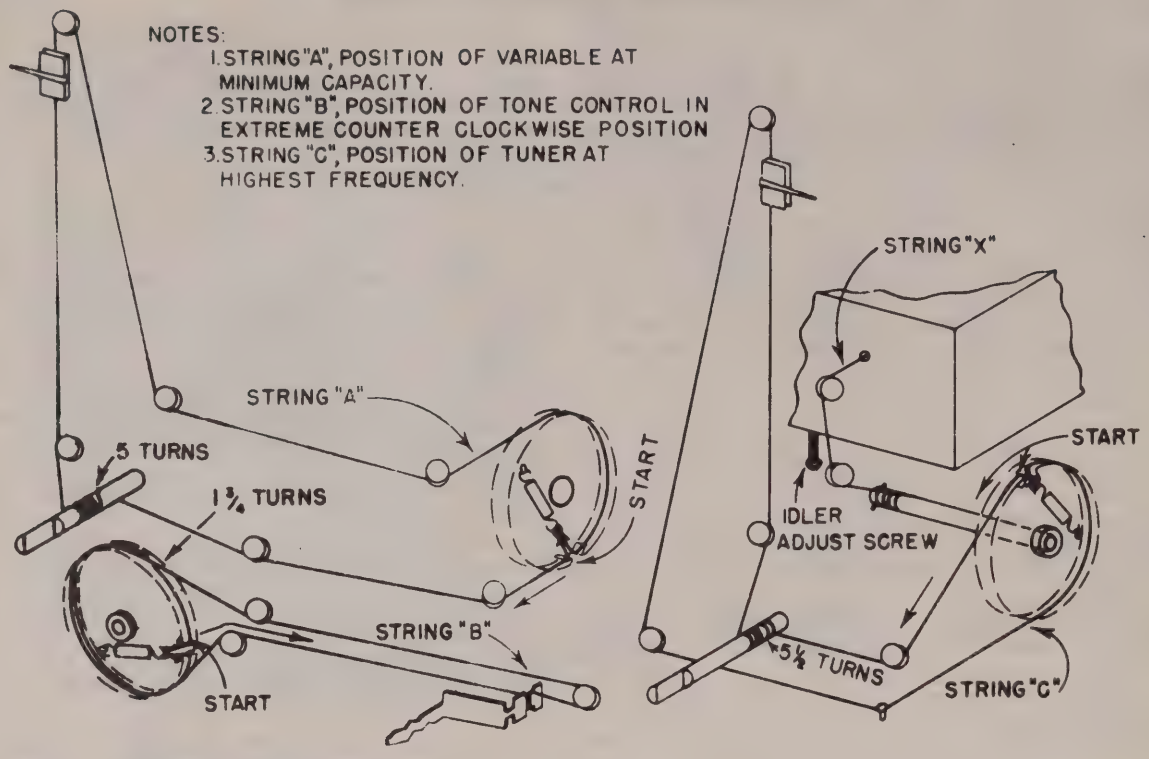
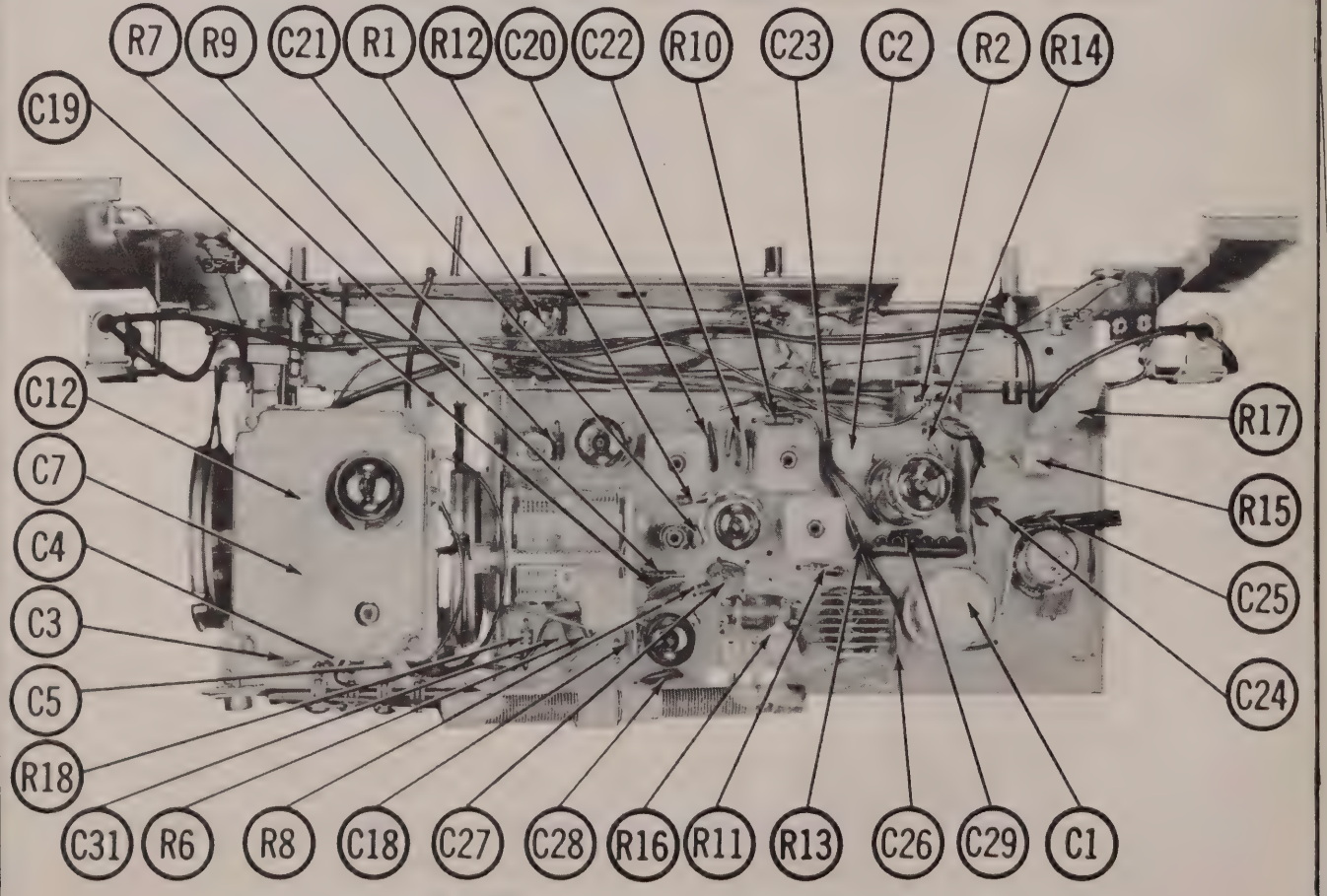


FIG. 2



DIAL CORD STRINGING



CHASSIS TOP VIEW - CAPACITOR & RESISTOR IDENT.

PHOTOFACT* Folder

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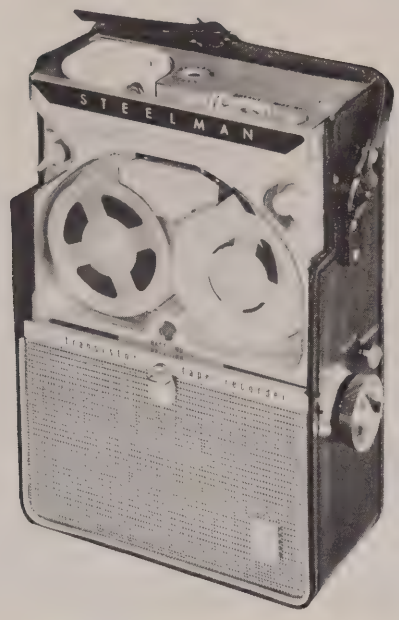
STEELMAN MODEL
Transitape 2-7111



GENERAL INFORMATION

The Steelman Transitape Model 2-7111 is a dual-track, transistorized, battery operated portable tape recorder.

The unit uses standard 3" reels and standard one-quarter inch magnetic tape.

The chart below indicates the playing time when various types of tape are used.

TAPE FOOTAGE AND TIME CHART

Type of Tape	Tape Length In Feet	Single Track		Two Track	
		1 7/8 IPS	3 3/4 IPS	1 7/8 IPS	3 3/4 IPS
1 1/2 Mil Regular	150	16 Min.	8 Min.	32 Min.	16 Min.
1 Mil Extra Play	225	24 Min.	12 Min.	48 Min.	24 Min.
1/2 Mil Double Play	300	32 Min.	16 Min.	64 Min.	32 Min.

Manufactured By:

Steelman Phono & Radio Co.
2-30 Anderson Ave.
Mount Vernon, N. Y.

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STEELMAN MODEL
Transitape 2-7111

STEELMAN MODEL
Transitape 2-7111

SET 466 FOLDER 12

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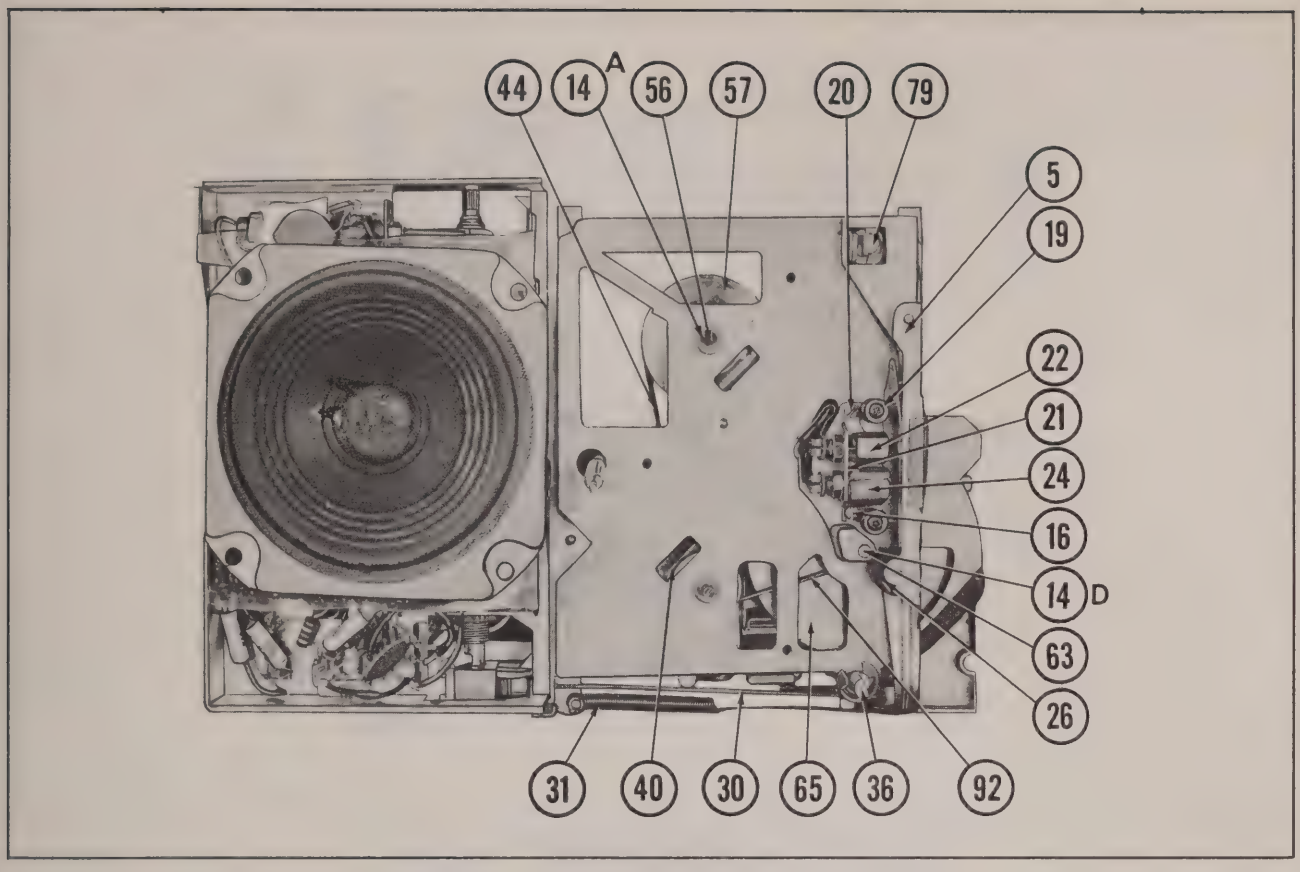

Figure 1. Recorder With Case and Covers Removed.

SPECIFICATIONS

Size:
6 1/2" x 9 3/4" x 2 7/8"

Functions:
Records from a microphone or other high-impedance source while automatically erasing the previously recorded material. Plays back through a built-in speaker. A jack is provided for an external speaker or for earphones.

Microphone:
Crystal, high-impedance type.

Heads (2):
Record-playback; half-track.
Erase; half-track.

Semiconductors:
Seven transistors -- all RCA 2N405 or equivalent.
Two diodes -- CBS 1N48G or equivalent.

Speaker:
4-inch PM dynamic; 3.2-ohm impedance.

Frequency Response:
100-6,000 cps at 3 3/4 ips.
100-4,000 cps at 1 7/8 ips.

Power Output:
100 milliwatts

Power Supply:
13 cells, Mallory RM-12R. Amplifier requires 6 cells for an 8.0-volt power source (approximate life, 200 hours). Motor requires 7 cells for 9.4-volt power source (approximate life, 50 hours). The Transitape may be operated on 220/110 volts AC by using Power Source Adapter No. 2-7155. A 12-volt automobile or boat battery source may be substituted for the motor cells only, by using Battery Adapter Cable No. 2-7156.

Power Consumption:
Motor battery (play and record) -- 50-80 ma.
Amplifier (playback, no signal) -- 20 ma.
Amplifier (record, no signal) -- 50 ma.

Tape Travel:
Record and playback speeds -- 3 3/4 and 1 7/8 ips.
Starting time -- less than 0.5 second to full speed.
Stopping time -- less than 1.0 second.
Fast forward -- winds a 150-foot tape in less than 2 minutes.
Rewind -- rewinds a 150-foot tape in less than 1 minute.

Battery-Level Indicator:
Neon lamp, NE #2 (motor cells only).

Record-Playback Level Indicator:
Neon lamp, NE #2

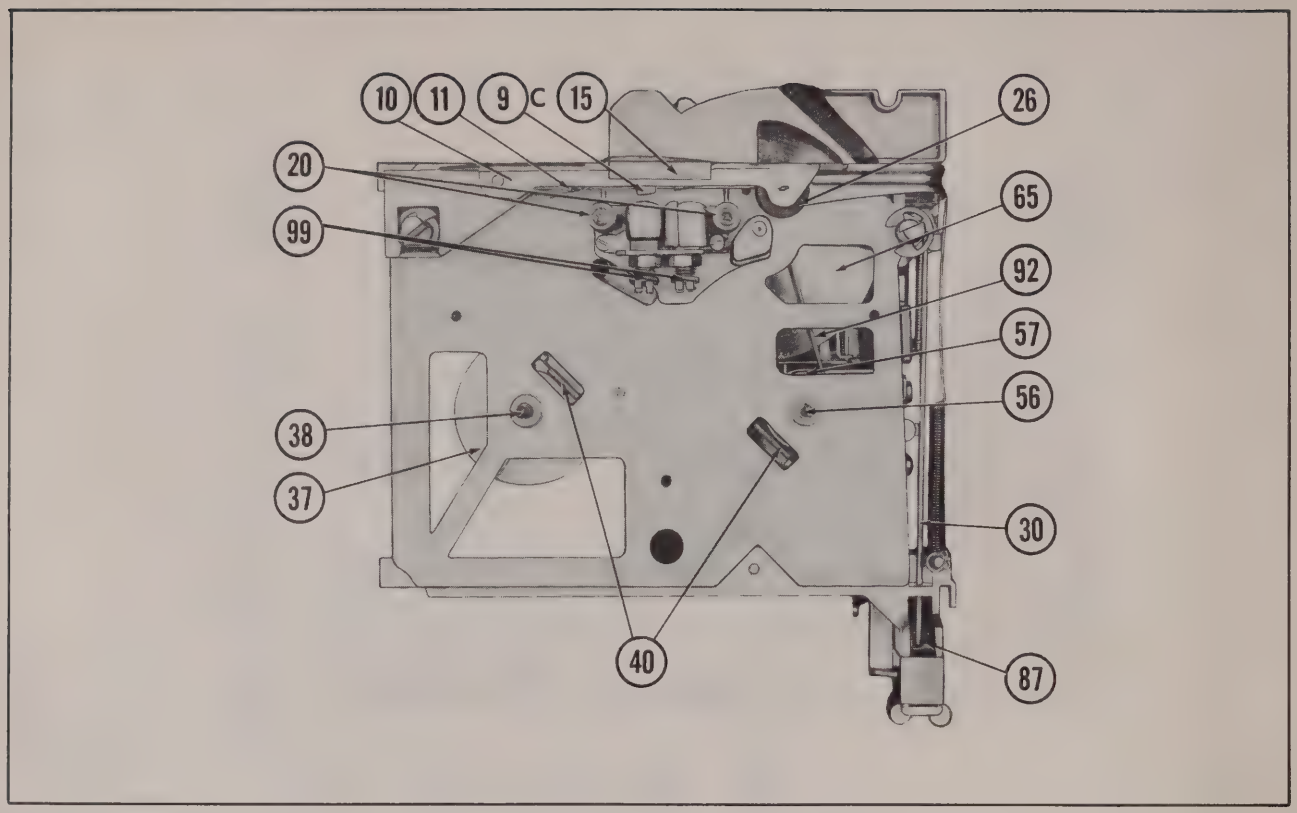

Figure 2. Transport Mechanism — Front View.

FUNCTIONS OF CONTROLS, INDICATORS, and SWITCHES

Function Control

The Function control regulates both the electrical and the mechanical operations of the recorder in each of the three positions: Off (extreme counterclockwise), Play, and Record.

In Off position, the Function control removes the power from the amplifier and motor. (The motor will still run, however, if the Fast Forward-Rewind control is not in Normal position.) Cam (28), holding up pressure arm (5) by means of pressure release rod (30), keeps pressure roller (26) away from capstan shaft (63), and pressure pads (9C) away from erase (22) and record (24) heads. Pressure roller (26) and pressure pads (9C) are mounted on pressure arm (5).

Play position is for listening to recordings. As the Function control is turned, its shaft moves cam (28), which allows pressure release rod (30) to drop. Further motion of cam (28) is blocked by a tab on record push-button arm (85), which prevents unintentional setting of the Function control to Record. Pressure arm spring (31) can now pull down pressure arm (5). As a result, pressure roller (26) pushes the tape against capstan shaft (63). This action pulls the tape across erase head (22) and record-playback head (24). The movement of pressure arm (5) causes pressure pads (9C) to bear on heads (22) and (24). This may be adjusted (see "Pressure Pads" under "Adjustments").

The Record push button must be depressed when the Function control is set to Record. This action moves record push-button arm (85), which permits cam (28) to move and the Function control shaft to turn. There is no further mechanical action as the Function control is moved from Play to Record position.

Fast Forward-Rewind Control

The Fast Forward-Rewind control regulates the tape drive mechanism. Normal position is for playback and record; Fast, for advancing the tape rapidly from the supply reel to the take-up reel; and Rewind, for returning the tape to the supply reel. This control activates the motor in the Fast and Rewind positions, even though the Function control may be turned off.

Mechanically, the Fast Forward-Rewind control acts in four ways:

a. If the Function control is in the Play or Record position, moving the Fast Forward-Rewind control from Normal position will move pressure arm (5). This action moves pressure roller (26) away from capstan shaft (63), and pressure pads (9C) away from record head (24) and erase head (22). Movement of the pressure arm (5) is accomplished by the flat side of rewind shaft (36) bearing on the sides of the square opening in the left end of pressure arm (5). If the Function control is in Off position, pressure arm (5) will already have rotated, so that moving the Fast Forward-Rewind control will have no effect.

b. If the Fast Forward-Rewind control is in Normal position, torque is applied from flywheel pulley (64) to take-up pulley (57) by spring belt (92). There is only enough tension on spring belt (92) to take up the tape as it is fed by pressure roller (26) and capstan shaft (63). In Fast Forward position, tightener pulley (58) on spring belt tightener arm (93), which is part of slide bar (35), moves and increases the tension on spring belt (92). As

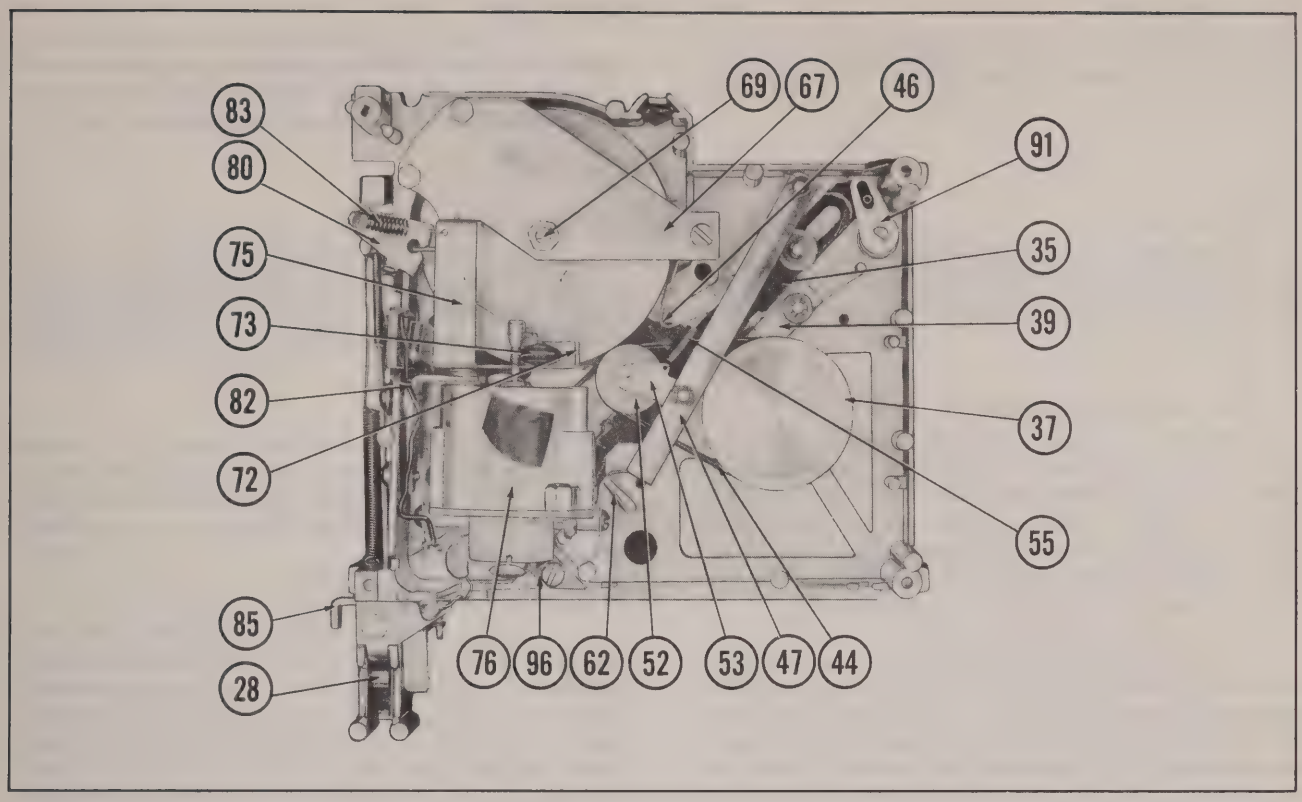

Figure 3. Transport Mechanism — Back View.

a result, take-up pulley (57) is driven with sufficient force to wind the tape. In Rewind position, the movement of slide bar (35) in the opposite direction releases the tension on spring belt (92). In addition, a stud on slide bar (35) releases the pressure on rewind yoke (53). Because of this action, rewind yoke spring (55) brings rewind idler pulley (52) into contact with flywheel (65). The revolving of rewind idler pulley (52) is transmitted by rewind belt (44) to rewind pulley (37), rewinding tape from take-up spool.

c. A slight movement of slide bar (35) from Normal position causes drive brakes (39) to press on rewind pulley (37) and take-up pulley (57) through brake linings (40). When the Function control is moved toward Fast position only, flywheel brake (46) contacts flywheel (65). Further motion removes the brake pressure. Detent spring (62) holds slide bar (35) in position when the slide bar has been moved into Fast or Rewind positions.
d. Movement of slide bar (35) from Normal position causes tab (35A) to contact rewind switch contact (95), closing motor circuit and activating motor (76).

Speed Selector Control

When the Speed Selector control is turned, speed change arm (80) rotates, speed change slide bracket (89) slides on slide bracket shaft (90), and idler roller (73) changes its point of contact with motor pulley (76) and flywheel (65). Speed change arm spring (83) holds speed change arm (80) in its set position. Slide bracket spring (75) keeps idler roller (73) in contact with motor pulley (76) and flywheel (65). In the 1 7/8-ips position, idler roller (73) transfers torque from the small-diameter portion of motor pulley (76) to a point near the edge of flywheel (65). In the 3 3/4-ips position, idler roller (73) works from the large-diameter portion of motor pulley (76) to a point nearer the center of flywheel (65). On some units, a tab on speed change arm (80) opens or closes tape speed switch (M9) and thus changes the resistance in the motor circuit as the tape speed is varied.

Volume Control

The Volume control adjusts the volume during record and playback. It has no mechanical function.

Battery Level Indicator

Glows when recorder is operating if motor batteries have adequate strength. When indicator goes out or fails to light while recorder is being used, replace motor batteries. This light does not indicate the condition of the amplifier batteries.

Recording Level Indicator

Volume control is adjusted during a recording so that recording level indicator flashes at medium brilliance during loud passages.

Remote-Control and Auxiliary Power Jack and Switch

Normal position is used for operating from self-contained batteries. Switch is in Auxiliary position when the following accessories are plugged into jack: (1) Hand Switch, Remote Control No. 2-7151; (2) Floor Switch, Remote Control No. 2-7152; (3) 220/110-volt AC, Power Source Adapter No. 2-7155; or (4) 12-volt DC, Car Battery Adapter Cable No. 2-7156. Refer to instructions with accessories for proper use.

Mike Input Jack

For high-impedance source, such as crystal or ceramic microphone, record player cartridge, tape recorder head, tuner output, etc.

Output Jack

For connecting external speaker or earphones. Built-in speaker is disconnected when this jack is used. Accompanying microphone may be used as earphone during playback by plugging it into output jack.

OPERATING INSTRUCTIONS

To Thread Tape

Put supply reel on left spindle and empty spool on right spindle. Lay tape in slot with shiny side upward. Wrap a few turns of tape on take-up spool to secure tape.

To Record With Microphone

Insert microphone into Mike input Jack. Set Speed Selector control at desired tape speed. Depress Safety Interlock button and turn Function control to Record. Adjust Volume control so recording level indicator lights up during loud passages. No warm-up is required. Turn Function knob to Off position at end of recording.

Since the Transitape Model 2-7111 is a dual-track machine, only the lower half of the tape is used during recording. After the entire reel is recorded, the full take-up reel is turned over and placed on the supply spindle, and a new recording can be made. Thus, the amount that can be recorded on a length of tape is doubled.

To Rewind Tape

With Function control in Off position, set Fast Forward-Rewind control to Rewind. When desired point is reached, return control to Normal position. Fast position is similarly used to move tape rapidly in the opposite direction.

To Play Tape

Thread tape as instructed under "To Thread Tape." Set Speed Selector control to speed at which tape was recorded. Fast Forward-Rewind Control is set to Normal position. Turn Function control to Play. Adjust Volume control.

To Edit and Splice Tape

Since one track cannot be spliced without affecting the other, recordings to be edited should be limited to one track. Unwanted portions can be cut out with scissors and the desired selections joined together. Tape should be cut at a slight diagonal and the ends joined with splicing tape on the glossy side. Excess splicing tape should be trimmed from side of recording tape.

NOTE: Use splicing tape only. Do not use regular cellophane tape.

DISASSEMBLY INSTRUCTIONS

To Install Cells

1. Remove the leather case top.
2. Pull off the Volume and Function knobs. Unscrew the Safety Interlock button.
3. Lift the entire mechanism straight up and out of the case.
4. Insert 13 cells in the clips on the back of the case. Observe the polarity.
5. To reassemble, reverse this procedure.

For Access To Amplifier Chassis

1. Follow procedure under "To Install Cells."
2. Remove the back cover (cell holder) to expose the transistor side of the amplifier chassis.
3. Remove the speaker to expose the wiring side of the chassis. To remove the speaker, unscrew the two Phillips head 6-32 speaker mounting screws and remove the tape, clips, and front speaker guard.
4. To reassemble, reverse this procedure.

ADJUSTMENTS

To Align Heads

While playing a prerecorded frequency-alignment tape on the recorder, loosen screw (16) holding head mounting bracket (21) to base (14). Adjust screw (18) for maximum volume.

Flywheel Bearings

Adjustable jewel bearing (69) may be tightened or loosened after bearing lock nut (70) is released. The adjustment is proper when flywheel (65) rotates freely without end play. Be sure to tighten bearing lock nut (70) after adjustment is made.

Speed

Tape speed may be adjusted by bending the stop tabs on speed change arm (80). For 3 3/4-ips tape travel, idler roller (73) rides one inch from the center of flywheel (65); for 1 7/8 ips, idler roller (73) rides 1 1/4 inch from the center of flywheel (65).

Preasure Pads

Pressure pads (9C) are adjusted for maximum volume on tape playback. Too great a pressure will cause wow and other distortion. To adjust, loosen screw (10) and move pressure pad adjuster arm (11). Moving arm (11) toward top of machine increases pressure, and vice versa.

Motor Height

The end of the motor pulley must be 15/32 inch from the flywheel to prevent slippage between motor pulley (76), idler roller (73), and flywheel (65). Motor bracket (82-761161) is adjusted by turning motor bracket adjusting screw (102). Motor bracket (82-761081) is adjusted by varying the tension on screws (101).

LUBRICATION

The Steelman Transitape Model 7111 uses jeweled and oilite bearings, which require no lubrication during normal operation. When machine is disassembled, grease sliding parts and put a drop of light machine oil on bearings.

CLEANING

Any accumulation of foreign matter on heads or on other parts contacting the tape will affect the quality and volume of reproduction. This foreign matter can be removed with a soft cloth moistened with ethyl alcohol. Carbon tetrachloride can be used, but is not recommended because of possible detrimental effect on mechanical parts and toxic effect on the user.

ELECTRONIC THEORY and OPERATION

Record

The signal from a crystal microphone connected to M14, is fed through section 2-rear of M7 and through C10 into the base of X1. The input impedance of X1, 100K ohms, loads the microphone and provides a rising high-frequency characteristic. Negative feedback of the high and midrange frequencies from X2 through C11 and R5 provides bass boost. The emitter-follower circuit of X1 is coupled to X2 through C4. X2 uses a grounded emitter for high gain. The signal from the collector of X2 goes to the slider of R1 through C6, and then through C7 to the base of X3. The driver stage (X3) is transformer-coupled (T1) to X4 and X5 for push-pull output. Voltage divider R18 and R19 provides bias for the base of X3; voltage divider R23 and R22 provide the bias for the base of X4 and X5. Capacitor C12, across the primary of T2, prevents high-frequency oscillation and also produces a slight high-frequency rise due to resonance.

Transformer T2 has two secondary windings: one, a low-impedance winding, has R26 for a load and also supplies feedback circuit C13, R25, C14, and R20. Capacitor C13 provides a low bass boost by feeding back the middle and high frequencies; C14 shunts the high frequencies to ground and thus prevents the loss of highs by negative feedback.

The high-impedance winding of T2 feeds two separate circuits. Through R17 the audio signal is fed to a symmetrical full-wave doubler circuit M3, M4, C19, and C20. Rectifier M3 charges C19 to the positive signal peak, and M4 charges C20 to the negative peak. The peak-to-peak signal causes M5 to fire, indicating the recording level. This circuit causes a minimum distortion to the audio signal and yet absorbs the transient peaks.

The signal from the high-impedance winding of T2 also goes through R16 and section 3-rear of M7 to recording head M12. The low side of this winding goes to B- instead of to ground. As a result, DC current flows through M12 to counteract the effects of the DC erase on the recording tape.

Transistors X6 and X7 operate as a push-pull oscillator whose output (25 to 30 kc) provides RF bias for recording. Oscillator coil L1 has an adjustable ferrite slug for frequency regulation. Bias signal is fed from the secondary winding of L1 through C18, where the signal mixes with the audio signal on the way to M12.

Collector current for X6 and X7 flowing through M13 provides DC erase for the tape recorder.

Play

When the unit is in Play position, the signal from record-playback head M12 is fed through section 3-rear and section 2-rear of M7 to the base of X1. From there, the signal path is the same as in the Record position, except for the following differences. Feedback circuit C11 and R5 is now grounded through section 2-rear of M7. The signal from the high-impedance secondary winding of T2 through R16 is now grounded by section 3-rear of M7. (The signal through R17 still operates M5.) The low-impedance secondary winding of T2 now feeds M15 and SP1 through section 1-front of M7. (R26 is out of the circuit.) The feedback network of C17, R25, C14, and R20 continues to function. When jack M15 is used, SP1 is disconnected.

When the unit is in Playback position, erase head M13 and the oscillator circuit are disabled by opening the B- line at section 3-front of M7.

Power Supply

Two separate sets of cells provide long battery life and low noise. The positive ends of both batteries are disconnected from the ground by section 2-front of M7 when the unit is in the Off position. In some units, section 1-rear of M7 connects the negative end of M1 to the positive end of M2 when the unit is in Off position, so that their combined voltages are available for rewind and fast forward. In later production units section 1-rear of M7 is not used, and just the motor battery provides power for this operation. Moving function switch M7 to Play or Record position grounds the B+ of both batteries through section 2-front of M7 and thus completes the motor and amplifier power circuits.

When M11 is running on good cells, its speed is held down to the required 3,100-3,300 rpm by an internal governor, which rapidly breaks the motor current. These pulses are stepped up by T3 and light indicator M6. When the cells are weak, the motor governor no longer opens; therefore, no pulses are generated to light M6. Thus, failure of M6 to light is a reliable indication of weak motor cells.

TROUBLE CHART

NOTE: Batteries should be checked first in all cases of defective operation, since a deficient power supply may produce varied and confusing symptoms. The following assumes good batteries, properly installed.

Symptom	Possible Cause	Remedy
Recorder fails to operate.	1. Remote-control switch in Auxiliary position.	1. Move switch to Normal position.
Tape fails to move in Play and Record positions; motor does not run.	1. Broken leads from battery to motor (76).	1. Check for open circuit with an ohmmeter.
	2. Defective motor (76).	2. Replace motor (76).
Motor runs; capstan shaft (63) fails to turn.	1. Motor height adjustment incorrect.	1. Adjust motor height. See "Motor Height" under "Adjustments".
	2. Idler roller (73) binds.	2. Straighten drive idler yoke (72) if bent. Lubricate idler roller shaft (71).
	3. Idler roller (73) worn or defective.	3. Replace idler roller (73).
	4. Flywheel(65) dirty or oily.	4. Clean flywheel (65) with alcohol. (See "Cleaning.")
	5. Capstan shaft (63) binds.	5. Adjust or replace jewel bearings (69) and (14D).
Capstan shaft (63) turns; take-up reel fails to function.	1. Spring belt (92) broken, weak, or missing.	1. Replace spring belt (92). (See Fig. 7.)
	2. Take-up shaft (56) binds.	2. Clean and lubricate take-up shaft (56).
	3. Tightener pulleys(58)bind.	3. Loosen grip rings (60) to permit free movement.
Capstan shaft (63) turns; tape fails to move.	1. Supply spindle shaft (38) binds.	1. Clean and lightly lubricate supply spindle shaft (38).
	2. Pressure roller (26) worn or dirty.	2. Clean pressure roller (26) with alcohol if dirty; replace if worn.
Pressure roller (26) fails to move against capstan shaft (63) in Play and Record positions.	1. Pressure arm spring (31) missing or broken.	1. Replace pressure arm spring (31).
	2. Insufficient pressure roller force (26).	2. Adjust pressure arm assembly.
Pressure roller (26) fails to move away from capstan shaft (63) in Off position.	1. Pressure release rod (30) missing, bent, or broken.	1. Repair or replace pressure release rod (30).
	2. On-off switch cam (28) missing or inverted.	2. Replace on-off switch cam (28).
Tape fails to move in both Fast Forward and Rewind positions with Function switch in Off position.	1. Broken leads to Fast Forward-Rewind switch (M10) or Function switch (M7).	1. Check continuity with an ohmmeter.
	2. Switch actuating tab (35A) bent or dirty.	2. Clean and adjust switch actuating tab (35A).
	3. Broken contacts on rewind switch (95).	3. Replace rewind switch (95).

TROUBLE CHART (Continued)

Symptom	Possible Cause	Remedy
Tape fails to rewind only.	1. Rewind belt (44) broken, missing, or off rewind idler pulley (52).	1. Replace rewind belt (44). Check position of belt retainer (47).
	2. Edge of flywheel (65) dirty.	2. Clean the edge of flywheel (65) with alcohol.
	3. Switch actuating tab (35A) bent or dirty.	3. Clean and adjust switch actuating tab (35A).
	4. Broken contacts on rewind switch (95).	4. Replace rewind switch (95).
Tape fails to move in Fast Forward position only.	1. Spring belt (92) broken, weak, or missing.	1. Replace spring belt (92). (See Fig. 7.)
	2. Take-up shaft (56) binds.	2. Clean and lubricate take-up shaft (56).
	3. Tightener pulleys (58) bind.	3. Loosen grip rings (60) to permit free movement.
Tape spills.	1. Brake linings (40) worn, missing, or dirty.	1. Replace brake linings (40).
Tape moves; no signal during playback.	1. No signal on tape.	1. See the following, "Machine Fails to Record or Erase."
	2. Broken connections between amplifier battery and amplifier.	2. Check continuity with an ohmmeter.
	3. Defective contacts on Function switch (M7).	3. Check with an ohmmeter.
	4. Foreign matter on recording head.	4. Clean recording head with alcohol. See "Cleaning."
	5. Pressure pads (9C) or pressure pad spring assembly (9A) and (9B) defective or missing.	5. Replace pressure pads (9C) or pressure pad spring assembly (9A) or (9B).
	6. Pressure pads (9C) not contacting tape.	6. Adjust pressure pad adjusting arm (11). See "Adjustments."
	7. Defective speaker (SP1).	7. Replace speaker (SP1).
	8. Output jack (M15) fails to short when plug is removed.	8. Clean contacts, or replace jack.
	9. Pressure arm spring (31) missing or broken.	9. Replace pressure arm spring (31).
Machine fails to record or erase.	1. Defective microphone assembly.	1. Replace microphone assembly.
	2. Defect in oscillator and/or amplifier circuits.	2. Check voltage and resistance measurements; replace defective components.

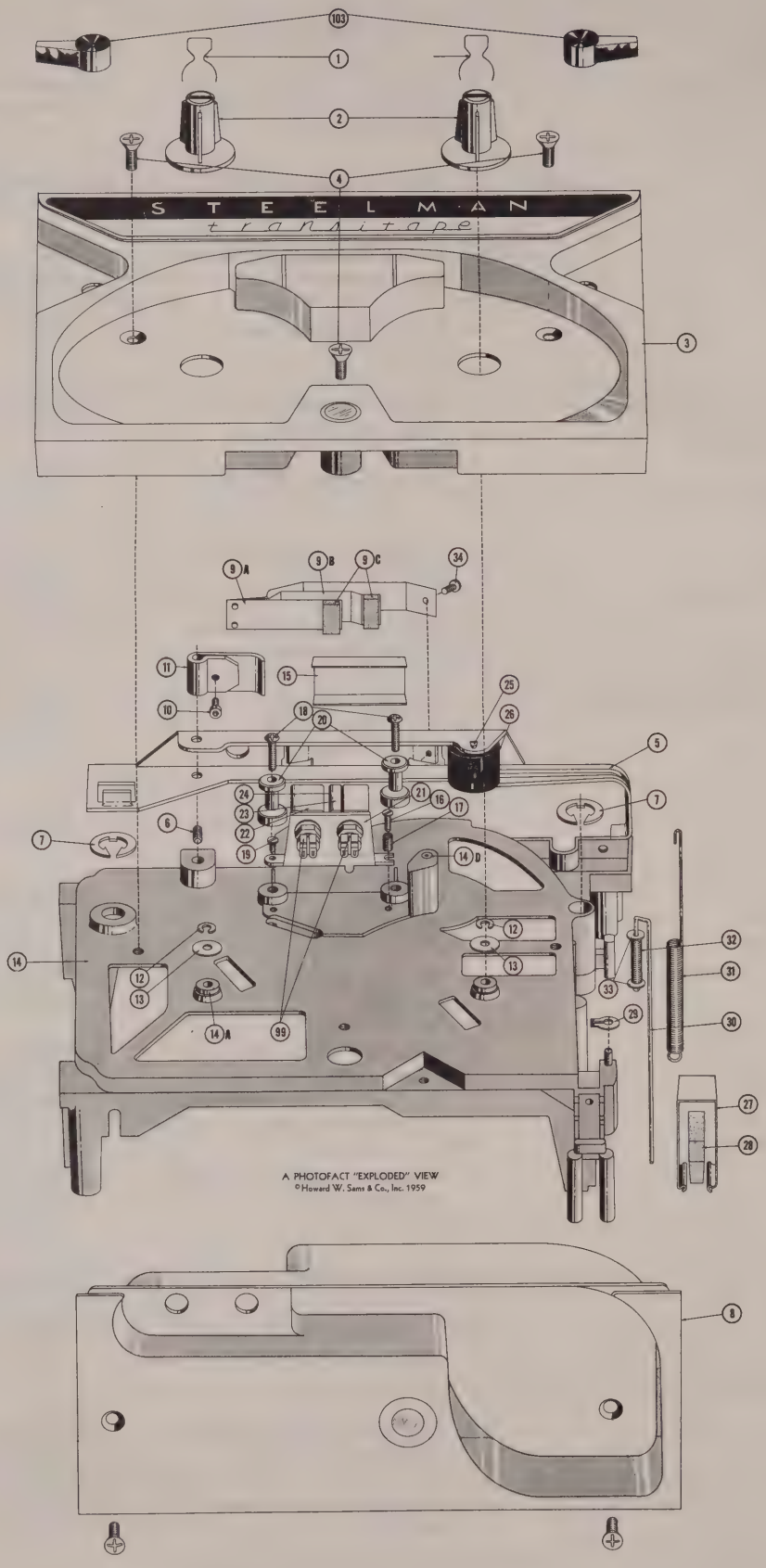

Figure 4A. Exploded View of Parts in Front of Base.

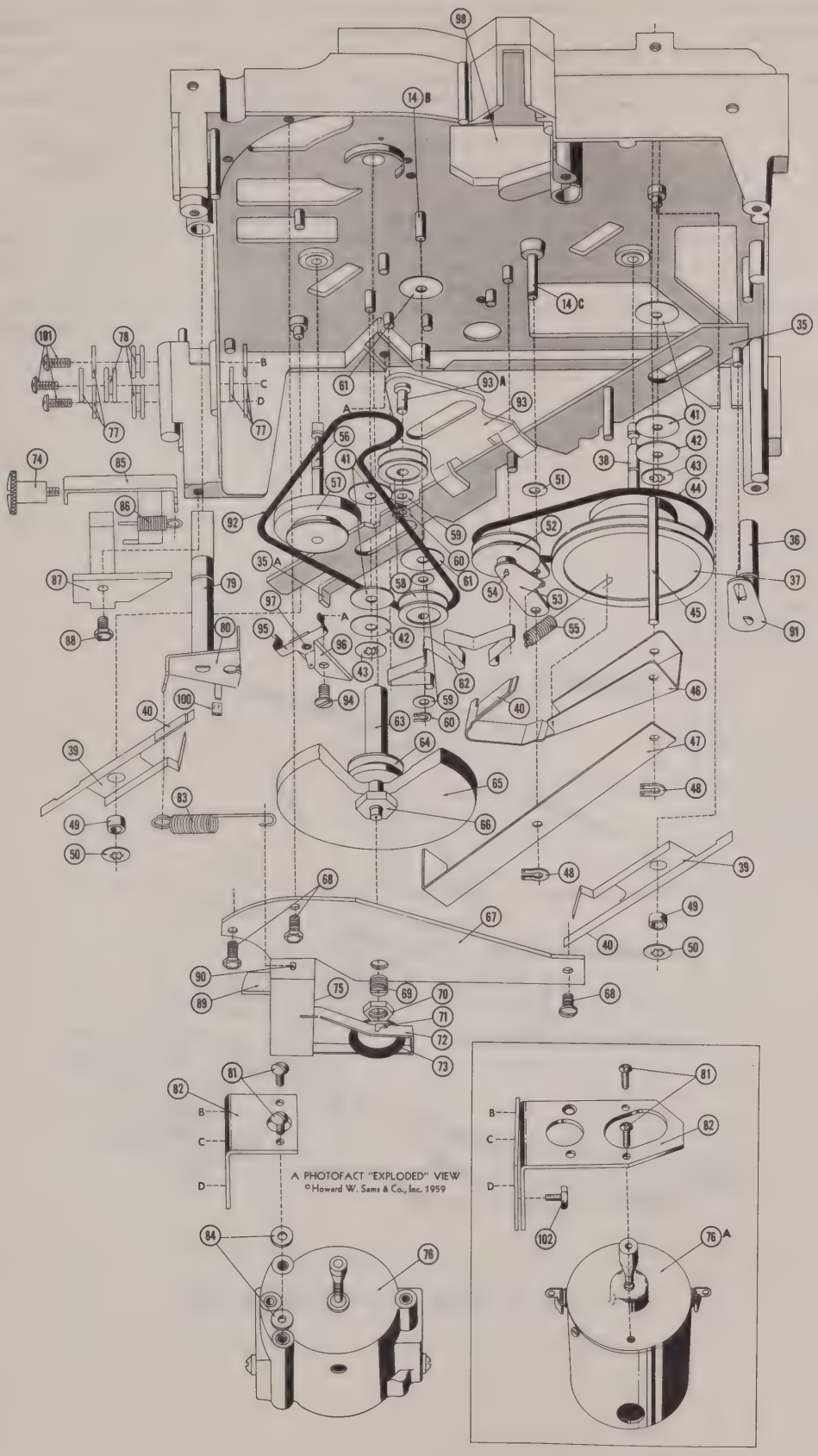

Figure 4B. Exploded View of Parts Behind Base.

TROUBLE CHART (CON'T.)

Symptom	Possible Cause	Remedy
Machine fails to record or erase.	3. Record (22) and erase (24) heads not properly aligned.	3. See "To Align Heads" under "Adjustments."
	4. Foreign matter on recording head.	4. Clean with alcohol. See "Cleaning."
	5. Defective or missing pressure pads (9C)or pressure pad spring assembly (9A) and (9B).	5. Replace pressure pads (9C)or pressure pad spring assembly (9A) and (9B).

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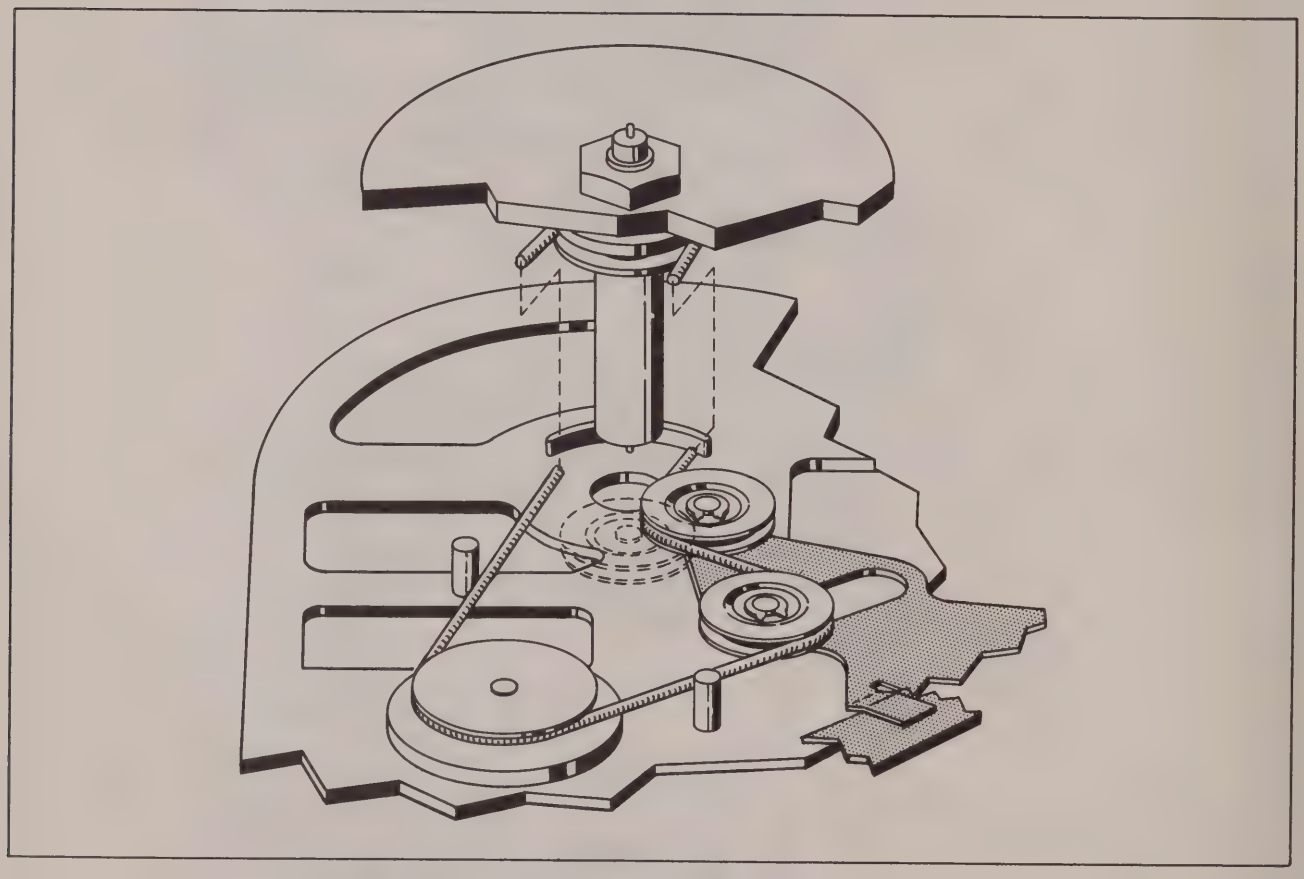

Figure 5. Proper Placing of Spring Belt.

TROUBLE CHART (Continued)

Symptom	Possible Cause	Remedy
Distorted or weak sound, or wow.	1. Idler roller (73) worn or defective	1. Replace idler roller (73).
	2. Flywheel(65)dirty or oily.	2. Clean flywheel (65) with alcohol.(See "Cleaning.")
	3. Capstan shaft (63) binds.	3. Adjust or replace jewel bearings (69) and 14D).
	4. Supply spindle shaft (38) binds.	4. Clean and lightly lubricate supply spindle shaft (38).
	5. Pressure roller (26) worn or dirty.	5. Clean pressure roller (26) with alochol if dirty; replace if worn.
	6. Pressure arm spring (31) missing or broken.	6. Replace pressure arm spring (31).
	7. Foreign matter on recording head.	7. Clean recording head with alcohol. (See "Cleaning.")
	8. Pressure pads (9C) or pressure pad spring assembly (9A) and (9B) defective or missing.	8. Replace pressure pads (9C)or pressure pad spring assembly (9A) and (9B).
	9. Pressure pads (9C) not contacting tape.	9. Adjust pressure pad adjusting arm (11).
	10. Defect in oscillator and/or amplifier circuits.	10. Check voltage and resistance measurements; replace defective components.

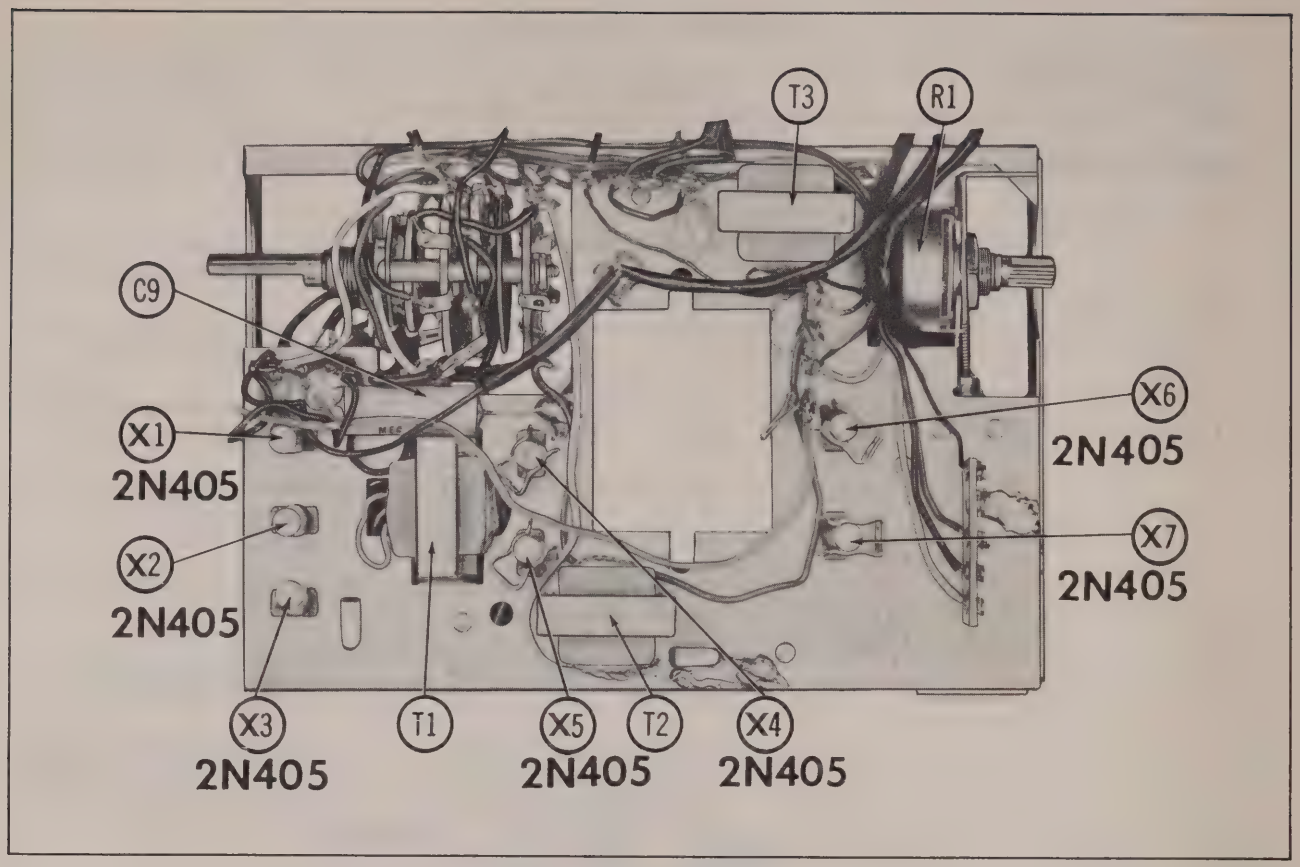

Figure 6. Amplifier Chassis – Back View.

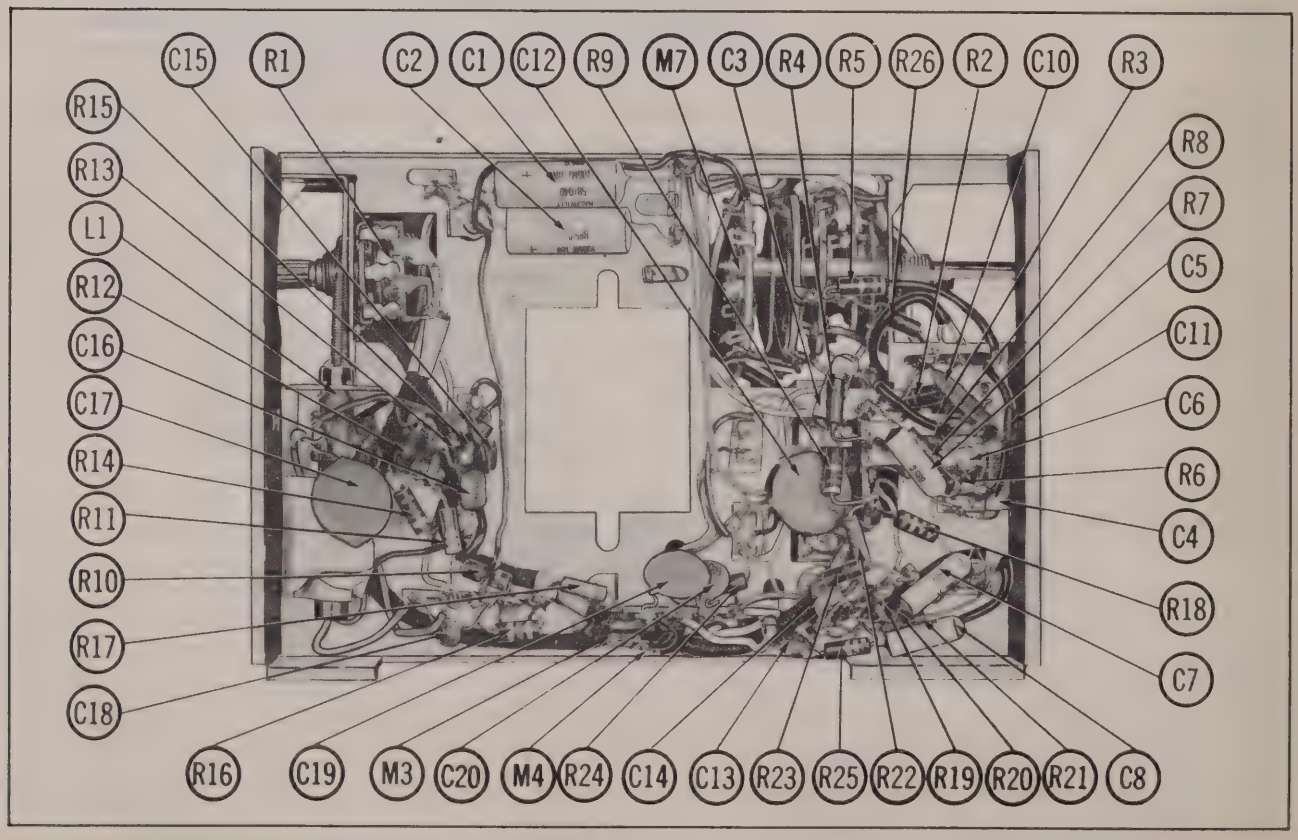

Figure 7. Amplifier Chassis – Front View.

ELECT. PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N405	Preamplifier		2N405	CK-872	2N405	PNP
X2	2N405	AF Amplifier		2N405	CK-872	2N405	PNP
X3	2N405	Driver		2N405	CK-872	2N405	PNP
X4	2N405	Output		2N405	CK-872	2N405	PNP
X5	2N405	Output		2N405	CK-872	2N405	PNP
X6	2N405	Bias Oscillator		2N405	CK-872	2N405	PNP
X7	2N405	Bias Oscillator		2N405	CK-872	2N405	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	100	10	581040	PWE10100	EC100-10	TT15X100	ML100-15	TE-1119. 3	
C2	100	10	581040	PWE10100	EC100-10	TT15X100	ML100-15	TE-1119. 3	
C3	10	10	581038	PWE10010	EC10-10	TT12X10	ML10-15	TE-1114	
C4	10	10	581038	PWE10010	EC10-10	TT12X10	ML10-15	TE-1114	
C5	10	5	581041	PWE6010	EC10-6	TT6X10	ML10-6	TE-1087	
C6	10	10	581038	PWE10010	EC10-10	TT12X10	ML10-15	TE-1114	
C7	10	5	581041	PWE6010	EC10-6	TT6X10	ML10-6	TE-1087	
C8	10	5	581041	PWE6010	EC10-6	TT6X10	ML10-6	TE-1087	
C9	100	5	581039	PWE6100	EC100-6	TT6X100	ML100-6	TE-1102	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C10	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20	
C11	50000		BPD-05	DD-503		CCD-503	GP150	5HK-S50	
C12	100000			DDA-104			BT-010	5HK-P10	
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C14	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C15	2000	(4000mmf) *	BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20	
C16	2000	(4000mmf) *	BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20	
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C18	150		BPD-00015	DD-151	L10T15	CCD-151	B-315	5GA-T15	
C19	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20	
C20	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20	
C21	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50	
C22	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50	

* Value used in late production.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A B	10K Shaft	½	368052	B-15 Not Req.	A47-10K-Z KSS-3	Q13-116 Not Req.	U20 Not Req.	Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1meg	
R3	22K	
R4	1000Ω	
R5	4700Ω	
R6	220K	
R7	220Ω	
R8	15K	
R9	4700Ω	
R10	470Ω	Note 1
R11	47K	(4700Ω) *
R12	1000Ω	(220Ω) *
R13	8200Ω	(1000Ω) *
R14	8200Ω	(1000Ω) *
R15	100Ω	(22Ω) *
R16	470Ω	
R17	27K	
R18	39K	
R19	8200Ω	
R20	47K	
R21	1000Ω	
R22	2200Ω	
R23	100Ω	
R24	10Ω	
R25	47K	
R26	10Ω	
R27	15Ω	Note 1
R28	39K	Note 2

* Value used in late production.
Note 1. Not used in late production.
Note 2. Not used in early production.

COILS

ITEM No.	USE	REPLACEMENT DATA						NOTES
		STEELMAN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Bias Oscillator	455083						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2. 5	1	430270						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.1	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	350Ω CT	3-4Ω SEC.2 10.5K	430577							

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T3	10V @ .067A	500Ω Res.		430578						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	
SP1	4" 4"	PM PM	3-4Ω 3-4Ω	404008 404016 ①	4A1	① Alternate Part Number

BATTERIES

ITEM No.	VOLTAGE	STEELMAN PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1. 5V			Z		915		M-15F	Six required (Amplifier)
M2	1. 5V			Z		915		M-15F	Seven required (Motor)

ELECT. PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		STEELMAN PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N486	359018	1N60	1N60	1N48	Recording Level Rectifier (Pigtail)
M4	1N486	359018	1N60	1N60	1N48	Recording Level Rectifier (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M5	Record Head	324506	
M6	Erase Head	324507	
M7	Switch	370048	Function (Section 1 rear not used in late production)
M8	Switch	370058	Remote Control & Auxillary Power (DPDT Slide Type)
M9	Switch		Tape Speed (Not used in late production)
M10	Switch		Fast Forward-Rewind
M11	Motor	311183	"General Industries"
	Motor	311184	"Barber Coleman"
	Microphone	830143	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

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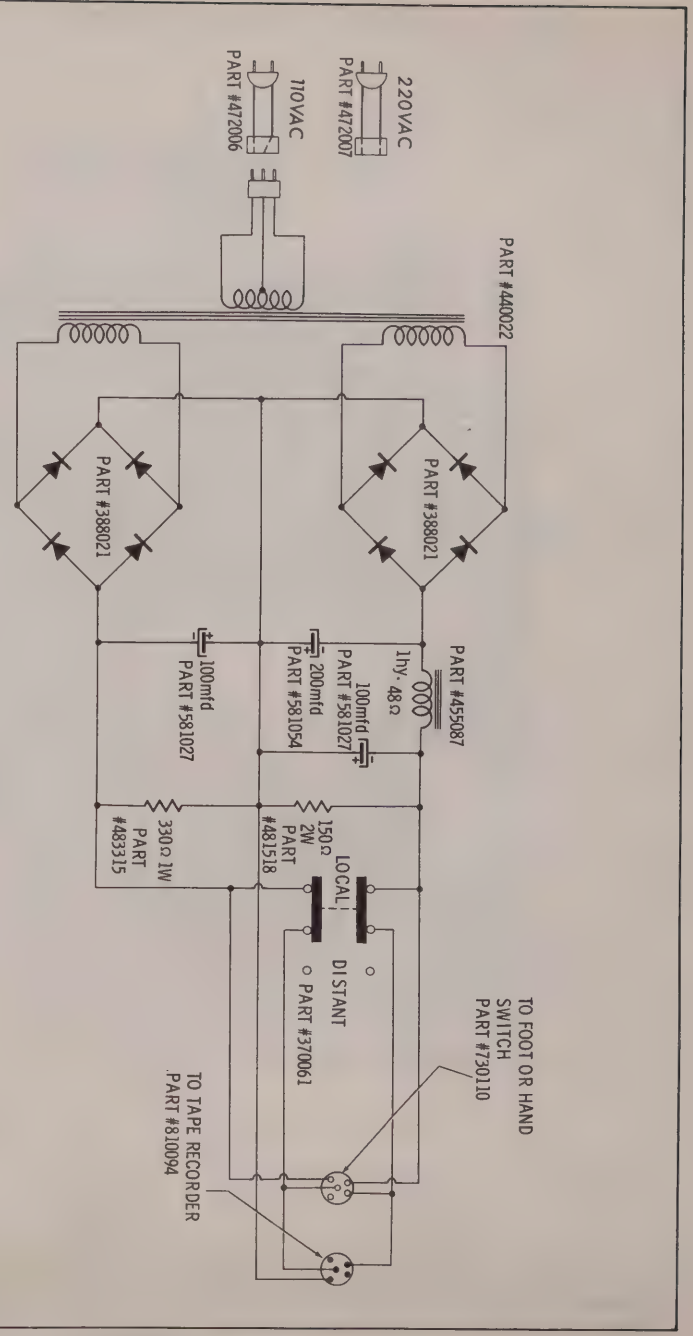
AC POWER SCHEMATIC



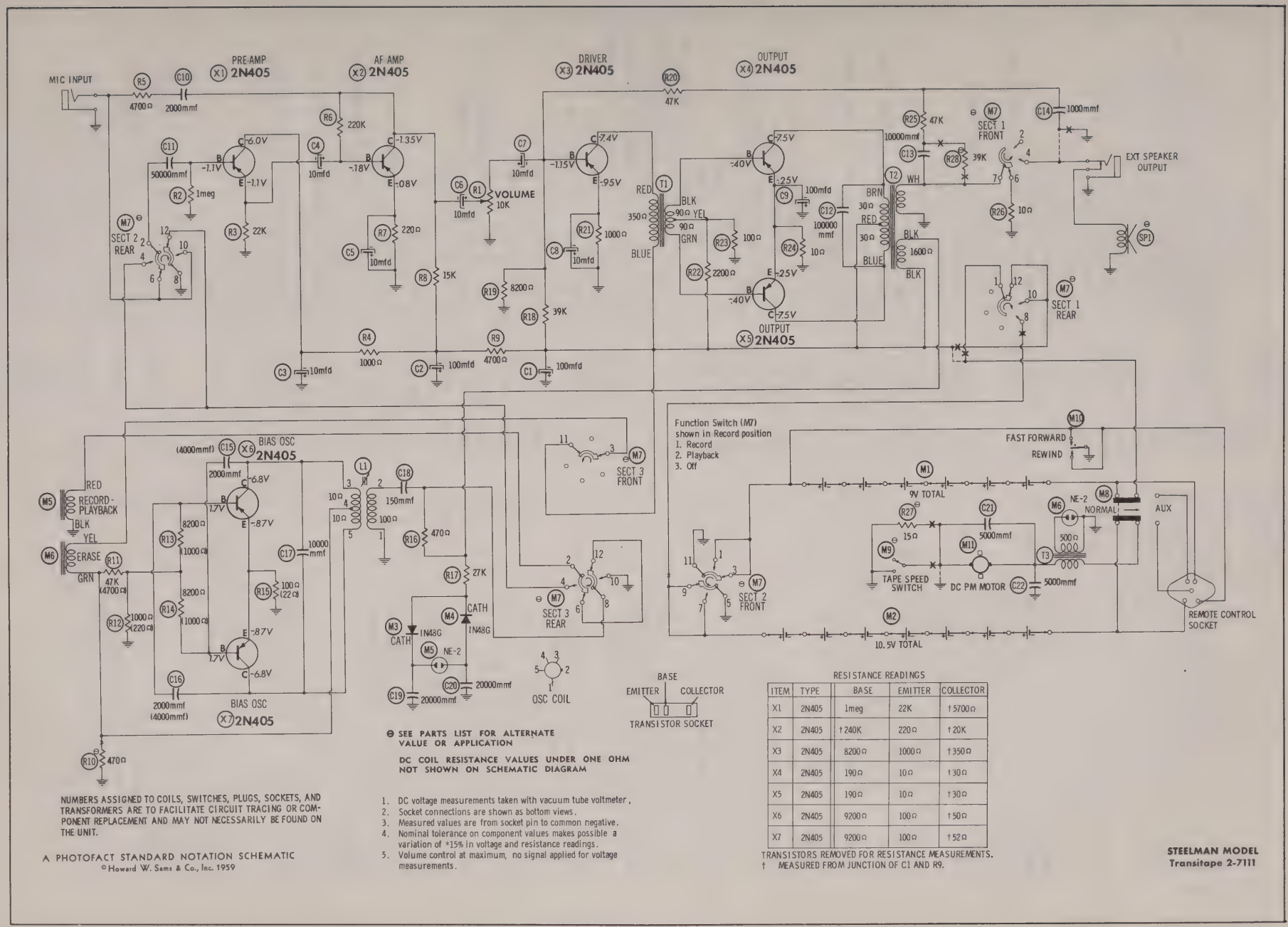


Figure 8. Schematic of Amplifier.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

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⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N405	1meg	22K	†5700Ω
X2	2N405	†240K	220Ω	†20K
X3	2N405	8200Ω	1000Ω	†350Ω
X4	2N405	190Ω	10Ω	†30Ω
X5	2N405	190Ω	10Ω	†30Ω
X6	2N405	9200Ω	100Ω	†50Ω
X7	2N405	9200Ω	100Ω	†52Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF C1 AND R9.

STEELMAN MODEL
Transitape 2-7111

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	678033	Spindle Spring (2 required)
2	761053	Spindle (2 required)
3	260080	Front Cover (gold for brown case)
	260101	Front Cover (silver for black case)
4	630894N	#6-1/4 Self-Tap Oval Head, Nickel Plated Screw (5 required)
5	761088	Pressure Arm
6	630921N	Allen Head Set Screw
7		Waldes Ring Washer (2 required)
8	260081	Top Cover (gold for brown case)
	260102	Top Cover (silver for black case)
9A	678046	Pressure Pad Spring Assembly
9B	761099	Pressure Arm Shield Spring
9C	990038	Pressure Pad (2 required)
10	630951N	2/56 x 1/8 Slotted B.H. Cadmium Plated Screw
11	761089	Pressure Pad Adjuster Arm
12	665022	Spindle Lock Ring (2 required)
13	693099	Washer (2 required)
14	761041	Base Casting
14A	700057	Spindle Bearing (2 required)
14B	700059	Tightener Pulley Stud
14C	700061	Casting Stud
14D	700045	Jewel Bearing, Fixed
15	761098	Pressure Arm Shield
16	630911N	2/56 x 7/16 Slotted B.H. Cadmium Plated Screw
17	678044	Head Mount Spring
18	630851	Guide Screw, 4/40 x 5/8 P.B.H. Cadmium Plated
19	630901N	2/56 x 1/4 Slotted B.H. Screw
20	700065	Tape Guide (2 required)
21	761090	Head Mounting Bracket
22	324507	Magnetic Erase Head
23	761091	Head Shield
24	324506	Magnetic Record Head
25	700067	Pressure Roller Shaft
26	700047	Pressure Roller
27	678036	Shaft Retainer
28	700049	On-Off Switch Cam
29		Waldes Lock Ring
30	700068	Pressure Release Rod
31	678037	Pressure Arm Spring
32	678038	Pressure Release Spring
33	693000	Pressure Rod Washer (2 required)
34	630901N	2/56 x 1/4 Slotted B.H. Cadmium Plated Screw
35	761075	Slide Bar
36	700063	Rewind Shaft
37	700054	Rewind Pulley
38	700055	Spindle Shaft A
39	761072	Drive Brake (2 required)
40	930025	Brake Lining (3 required)
41		Washer
42	699118	Hubbard Bowed Washer (2 required)
43	665028	United Carr Fastener, (2 required)
44	930023	Rewind Belt
45	700060	Casting Stud
46	761032	Flyback Brake
47	761151	Belt Retainer
48		Waldes Ring (2 required)
49	700074	Brake Spacer (2 required)
50	665028	United Carr Fastener (2 required)
51		Washer
52	700064	Rewind Idler Pulley
53	761069	Rewind Yoke
54	700072	Rewind Pulley Shaft
55	678041	Rewind Yoke Spring
56	700056	Spindle Shaft

Ref. No	Part No.	Description
57	700053	Takeup Pulley
58	700066	Tightener Pulley (2 required)
59	693019	Tightener Arm Washer (3 required)
60		Waldes Grip Ring (2 required)
61	693369	Washer (2 required)
62	678034	Detent Spring
63	700050	Capstan Shaft
64	700051	Flywheel Pulley
65	700052	Flywheel
66	660911	Flywheel Lock Nut
67	761068	Bearing Support
68	630871N	#6-3/16 Hex Head Self-Tap Screw (3 required)
69	700046	Jewel Bearing, Adjustable
70	660911	Bearing Lock Nut
71	700069	Idler Roller Shaft
72	761071	Drive Idler Yoke
73	700048	Idler Roller
74	700073	Record Pushbutton, Nickel Plated (for black case)
	700078	Record Pushbutton, Brass Plated (for brown case)
75	678039	Slide Bracket Spring
76	311183	Motor, General Industries
76A	311184	Motor, Barber-Coleman
77	693170	Washer, Flat (6 required)
78	347014	Rubber Grommet (3 required)
79	700062	Speed Change Shaft
80	761078	Speed Change Arm
81	630861N	8/32 x 1/8 P.B.H.M.S. Cadmium Plated Screws for General Industries Motor (2 required) Screws for Barber-Coleman Motor (2 required)
82	761081	Motor Bracket (fits only G.I. Motor)
	761161	Motor Bracket, Universal
83	678040	Speed Change Arm Spring
84		Washer (2 required)
85	761079	Record Pushbutton Arm
86	678043	Pushbutton Spring
87	678035	Cam Spring
88	630871N	#6-3/16 Hex Head Self-Tap Screw
89	761070	Speed Change Slide Bracket
90	700071	Slide Bracket Shaft
91	761082	Actuator Arm
92	678042	Spring Belt
93	761176	Spring Belt Tightener Arm
93A	700058	Tightener Arm Stud
94	630871N	#6-3/16 Hex Head Self-Tap Screw
95	761033	Rewind Switch Contact
96	750027	Rewind Switch Insulated Block
97	680011	Switch Rivet
98	920030	Overload Indicator Bulb Retainer
99	730109	Magnetic Head Socket (2 required)
100	477414	5/16" General Purpose Plastic Tubing #14
101	617111N	6/32 x 1/4 P.B.H.M.S. Screw (3 required)
102		Motor Bracket Adjusting Screw
103	272298	Take-up-Rewind Knob, Brass (for brown case) (2 required)
	272320	Take-up-Rewind Knob, Nickel (for black case) (2 required)
	678045	Flat Retainer Spring for Knobs
	760947	Battery Clip (26 required)
	760047	Battery Tie Bar (10 required)
	672003	Battery Lug (6 required)
	750028*	Control Switch Insulating Block
	761093*	Switch, Outside Contact
	761094*	Switch, Inside Contact

MECHANICAL PARTS LIST (Cont.)

Ref. No.	Part No.	Description
	680111*	Switch Rivet (2 required)
	761134	Control Support Bracket
	920101	Battery Insulator
	920100	Switch Insulator (fishpaper)
	761060	Side Cover
	930026	Foam Rubber Cradle for Mike
	260092	Speaker Shield
	920094	Amplifier Cover
	830143	Microphone Assembly

* May be omitted.

PHOTOFACT* Folder

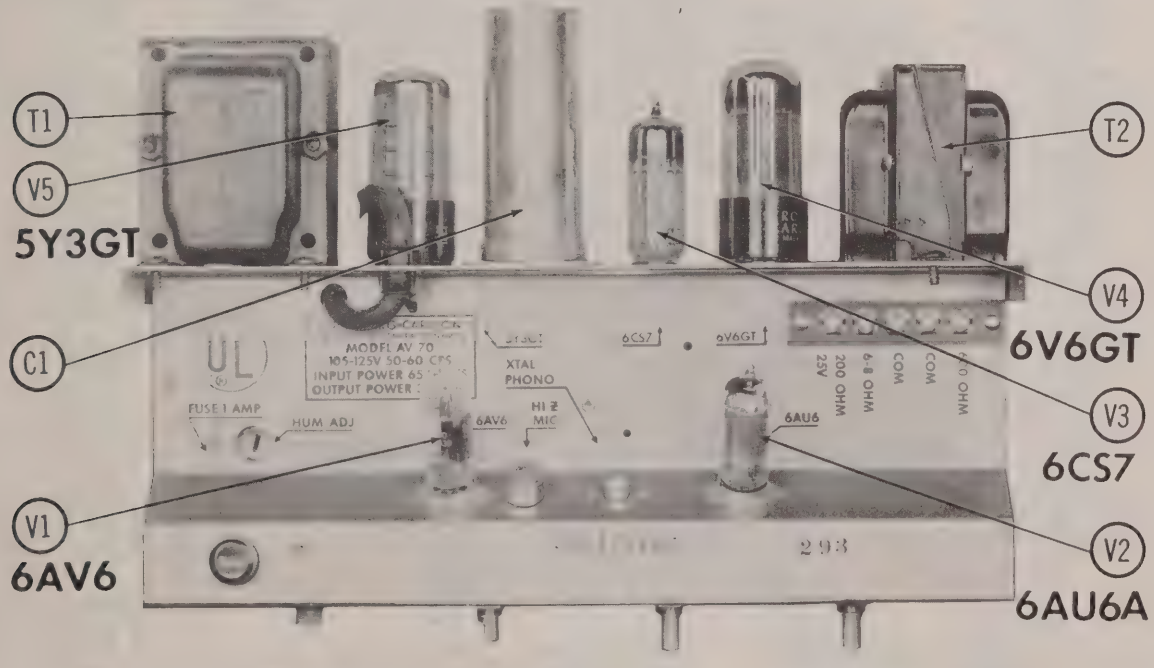
EIA

STROMBERG-CARLSON MODEL AV-70

STROMBERG-CARLSON
MODEL AV-70

STROMBERG-CARLSON
MODEL AV-70

TRADE NAME	Stromberg-Carlson Model AV-70
MANUFACTURER	Stromberg-Carlson Co., Special Products Div., 1400 N. Goodman St. Rochester 9, N. Y.
TYPE SET	AC Operated 5 Tube Audio Amplifier
POWER SUPPLY	105-125 Volts AC, 50-60 Cycles RATING 64 Watts, .65 Amp. @117 Volts AC



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JW304

DATE 12-59

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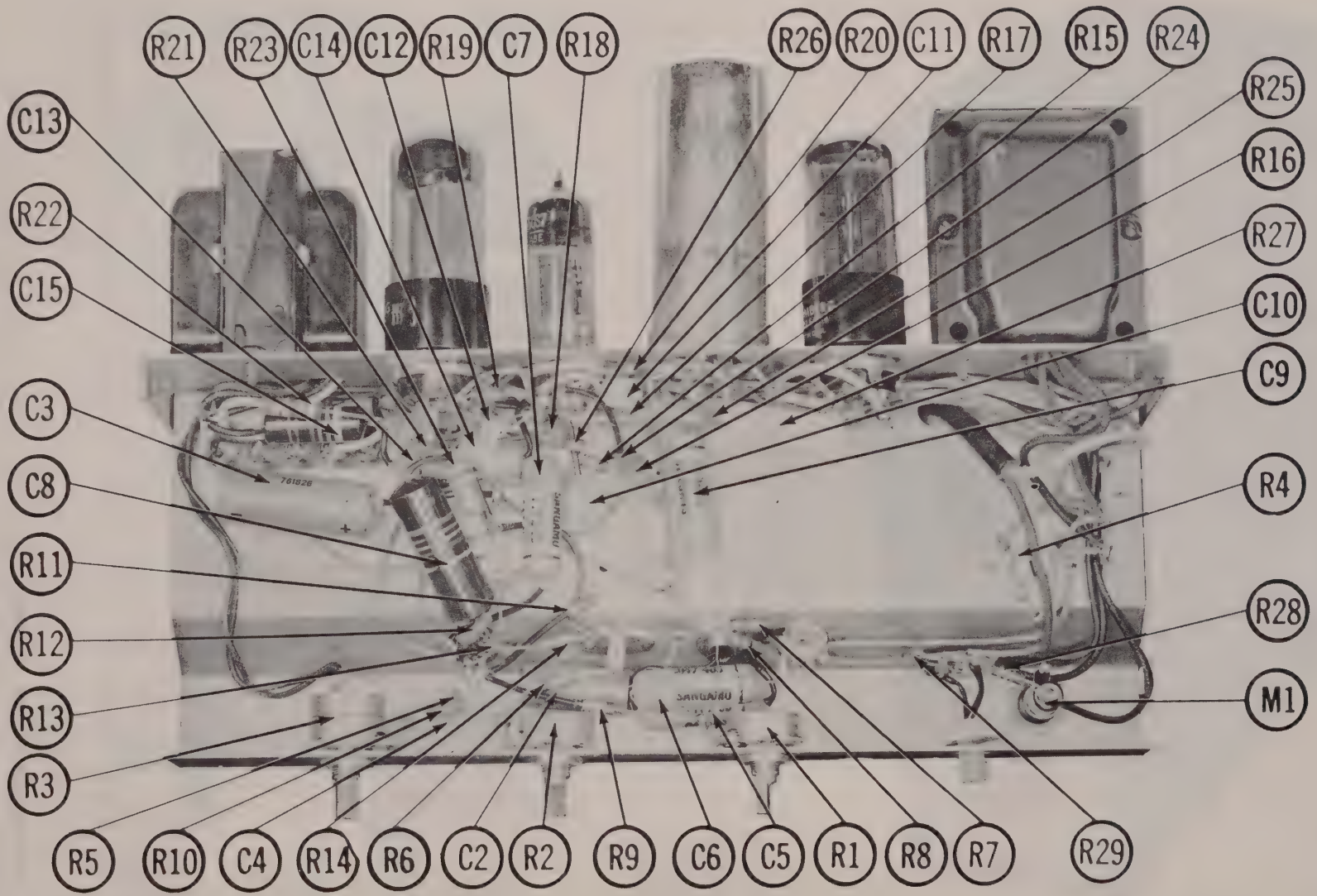
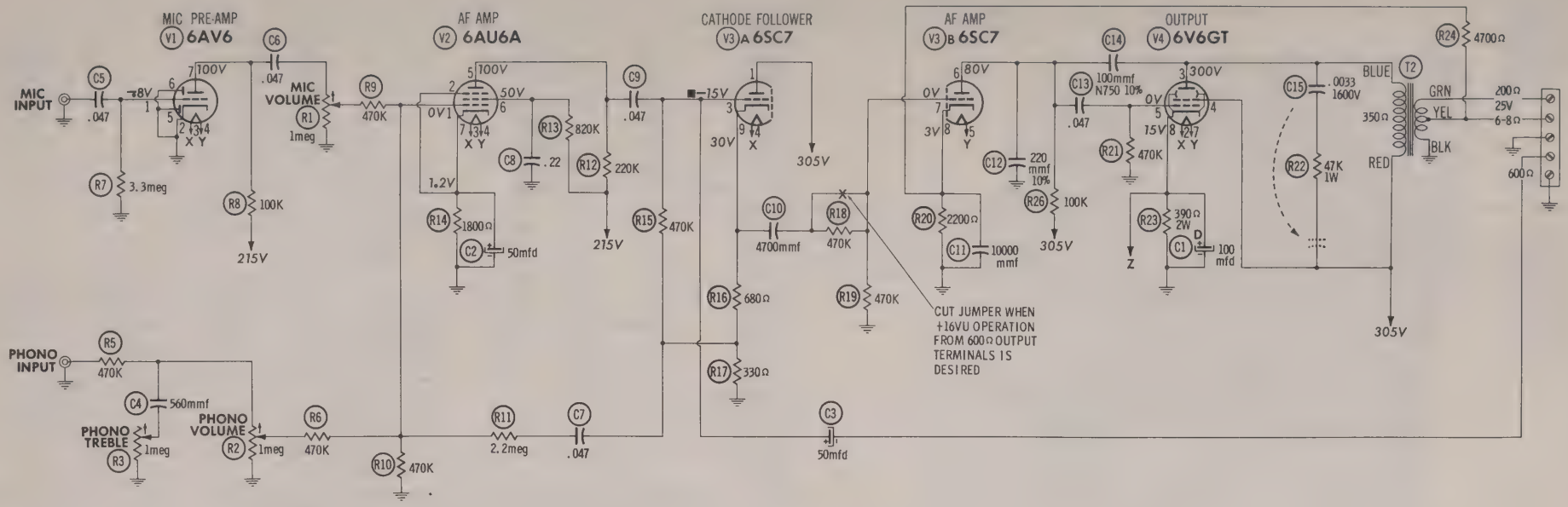


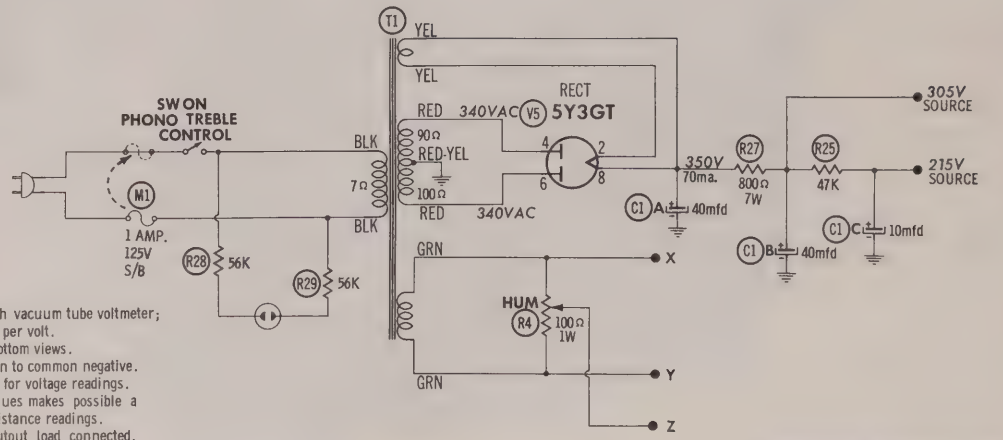
CHASSIS BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AV6	3.3meg	0Ω	420Ω	420Ω	0Ω	0Ω	†150K		
V2	6AU6A	160K	1800Ω	420Ω	420Ω	†270K	†870K	1800Ω		
V3	6CS7	†800Ω	NC	470K	420Ω	420Ω	†100K	470K	1600Ω	1000Ω
V4	6V6GT	TP	420Ω	†1100Ω	†800Ω	470K	TP	420Ω	390Ω	
V5	5Y3GT	NC	¶	NC	90Ω	NC	100Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5.
■ MEASURED FROM PIN 9 OF V3.
NC NO CONNECTION
TP TIE POINT



Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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STROMBERG-CARLSON MODEL AV-70

STROMBERG-CARLSON MODEL AV-70

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Mic. Preamp.	6AV6
V2	AF Amplifier	6AU6A
V3	Cath. Follower-AF Amp.	6CS7
V4	Output	6V6GT
V5	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Stromberg-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	450	111115-000	AFH4-87	D0660	FP431.7	TMQ-100	TVL-4747	
B	▬40	450							
C	▲10	450							
D	100	50							
C2	50	6	111615	SRE6V50	BBR50-6	TT6X50	TD-50-6	TVA-1100	
C3	50	50	111616-000	PRS50V50	BR505	TC39	TD-50-50	TVA-1308	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	560		DI-560	DD-561	L10T56	CCD-561	B-356	5GA-T56
C5	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C7	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C8	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C9	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C10	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C12	220 10%		DI-220	MD-221	L10T22	CCD-221	JL-220	10TS-T22
C13	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C14	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C15	.0033 1600V		P1684CM-0033	0016-302	CUB16D33	16-DP-2-332	GEM-16233	MB-D33

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	145000-055	B-70	A47-1meg-Z	Q13-137	U53	Mic. Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1meg	½	145000-055	B-70	A47-1meg-Z	Q13-137	U53	Phono Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	145000-054	B-69	A47-1meg-S	Q11-137	U54	Phono Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Off-On
R4	100Ω	1(WW)	173853-000				FL100P	Hum

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	470K	
R6	470K	
R7	3.3meg	
R8	100K	
R9	470K	
R10	470K	
R11	2.2meg	
R12	220K	
	820K	

ITEM No.	RATING	REMARKS
R14	1800Ω	
R15	470K	
R16	680Ω	
R17	330Ω	
R18	470K	
R19	470K	
R20	2200Ω	
R21	470K	
R22	47K 1W	

ITEM No.	RATING	REMARKS
R23	390Ω 2W	
R24	4700Ω	
R25	47K	
R26	100K	
R27	800Ω 7W	
R28	56K	
R29	56K	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .65A	680 VCT @.070A	5V@ 2A	161000-204						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V@ 1.8A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	8000Ω	200Ω (25V) Tap@ 6-8Ω	161000-152							

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Stromberg-Carlson PART No. FUSE	Stromberg-Carlson PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1A 125V S/B	555020-219		313001 (3AG 1A 125V) S/B	342012	MDL 1	HKP

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder with CIRCUITRACE*

EIA

SYLVANIA MODELS
1303RE, TU, YE (Ch. 1-631-1)

SYLVANIA MODELS
1303RE, TU, YE (Ch. 1-631-1)

SYLVANIA MODELS
1303RE, TU, YE (Ch. 1-631-1)

TRADE NAME	Sylvania Models 1303RE, 1303TU, 1303YE (CH. 1-631-1)
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products, Inc., 700 Ellicott St., Batavia, N. Y.
TYPE SET	AC-DC Operated 5 Tube AM Receiver
POWER SUPPLY	110-120 Volts AC, 60 Cycles — RATING 26 Watts, .28 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 — 1650KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1 thru A4..... GENERAL CEMENT #5097, 8727
WALSCO #2515

A5, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A7..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1650KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	600KC Signal	"	A6	"
4.		"	"	"	"	A7	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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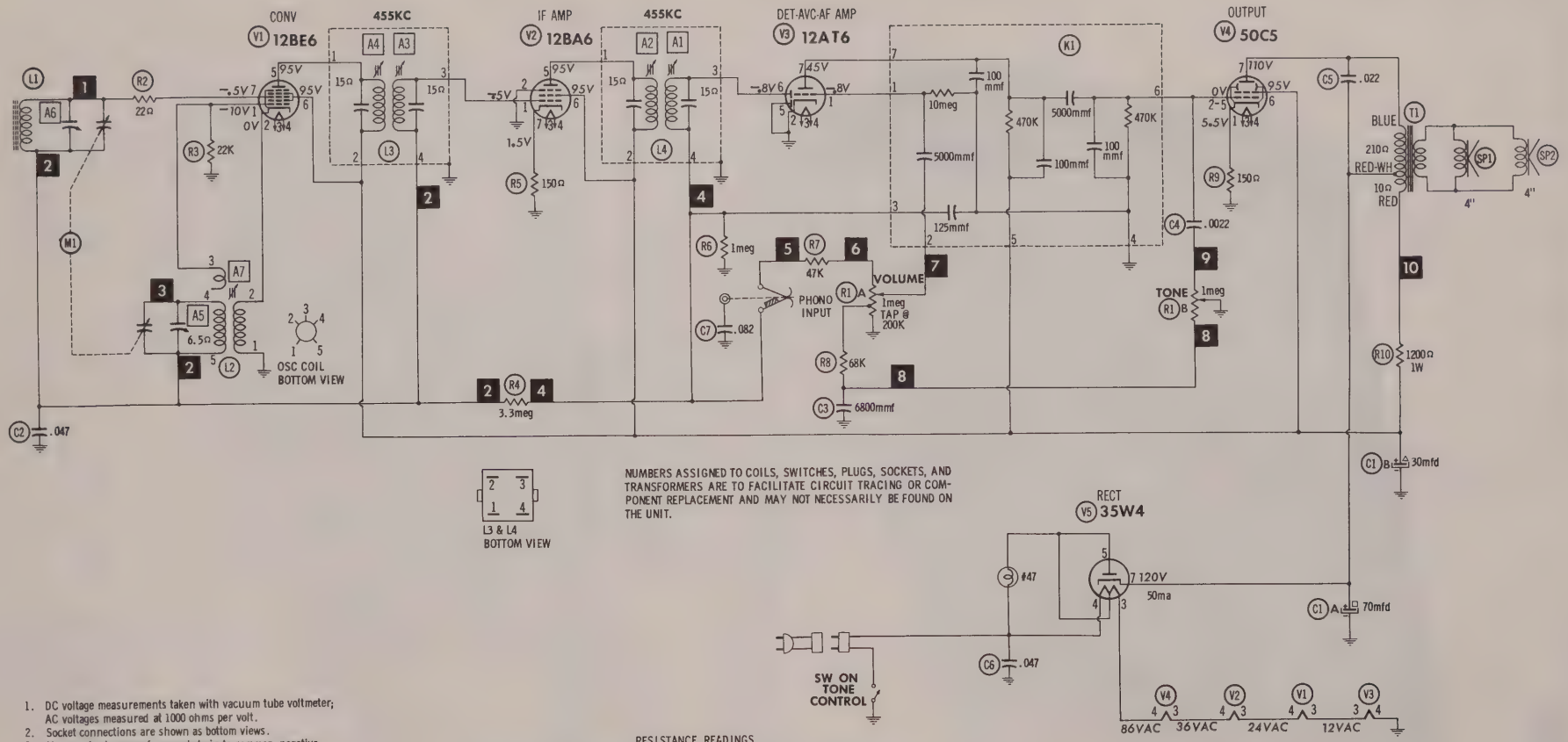
JG287

SET 466 FOLDER 14



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

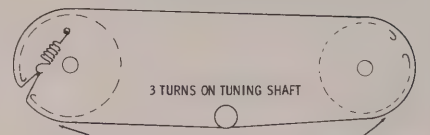
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	12Ω	24Ω	†1200Ω	†1200Ω	4.3meg
V2	12BA6	4.3meg	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	150Ω
V3	12AT6	10meg	0Ω	12Ω	0Ω	0Ω	1meg	†470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	†1200Ω	†210Ω
V5	35W4	NC	TP	86Ω	120Ω	105Ω	105Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5
NC NO CONNECTION
TP TIE POINT

DIAL CORD STRINGING



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SYLVANIA MODELS
1303RE, TU, YE (Ch. 1-631-1)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12BE6	V4	Output	50C5
V2	IF Amplifier	12BA6	V5	Rectifier	35W4
V3	Det-AVC-AF Amp.	12AT6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■70	150	161-2016	AFH2-17-50	B0180 ‡	PFP214.3		PCL-2441	
B	▲30	150							

‡ Use printed circuit adaptor #55277 and 55278.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C3	6800				BPD-0068	DD-682	BYA10D68	B-268	5HK-D68	
C4	.0022	400			P488N-0022	D6-222	CUB6D22	GEM-6222	6TM-D22	
C5	.022	400			P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C6	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C7	.082	400							5BF-S82	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	152-0054					Volume, Tap @ 200K
B	1meg	½						Tone
C	Switch							Push-Pull Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SYLVANIA PART No.	NOTES
	OHMS	WATT		
R2	22Ω			
R3	22K			
R4	3.3meg			
R5	150Ω			
R6	1meg			

ITEM No.	RATING		SYLVANIA PART No.	NOTES
	OHMS	WATT		
R7	47K			
R8	68K			
R9	150Ω			
R10	1200Ω	1		

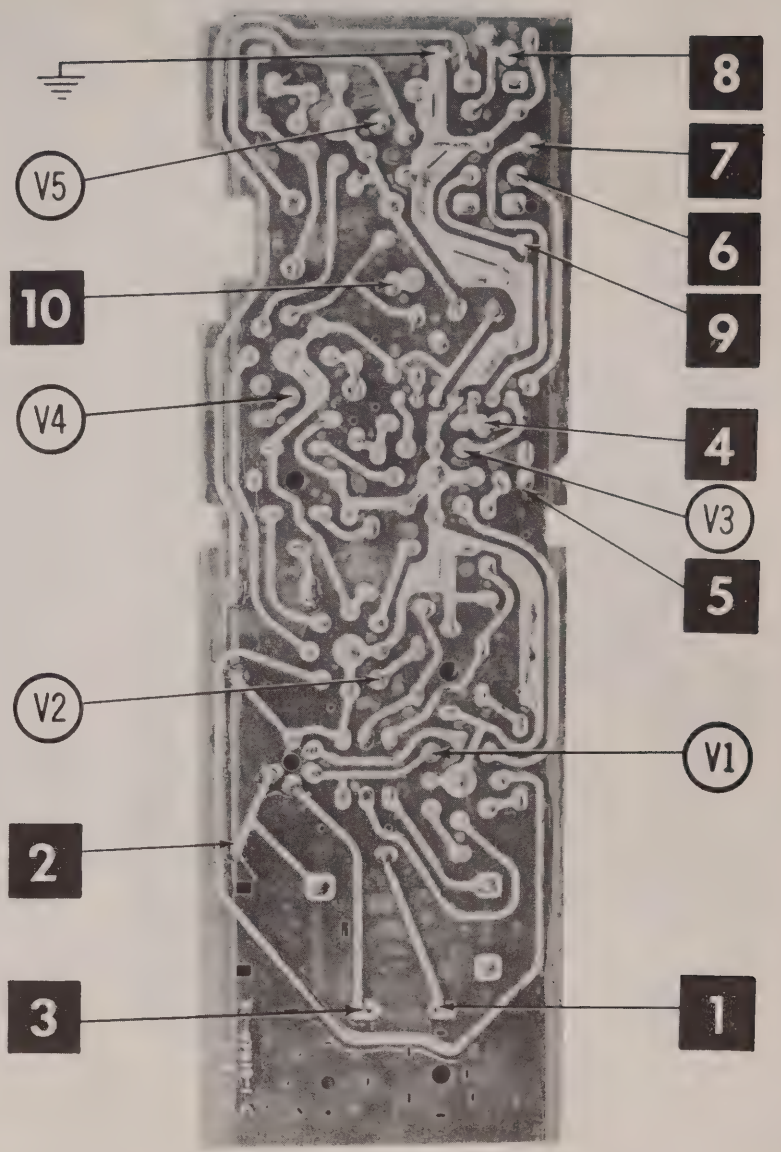
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	Detector Audio Coupling	100mmf, 100mmf, 100mmf, 125mmf, 5000mmf, 5000mmf, 470K, 470K, 10meg	190-0028	

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SYLVANIA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	581-0015						
L2	Osc. Coil	113-0046						
L3	Input IF Trans.	121-0108	16-6780	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF Trans.	121-0108	16-6780	16-6780	BC-357	13-PC2	RF-4	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2500Ω Tap ⓐ 6%	3-4Ω	(Part of SP1)	24S50A	A-3031		A-3336	24S50A	S-16X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	4"	PM	6-8Ω	539-0432①	4A07Z7.1	① Includes T1
SP2	4"	PM	6-8Ω	539-0431	4A07Z7.1	

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M1	Tuning Cap	170-0030	2 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

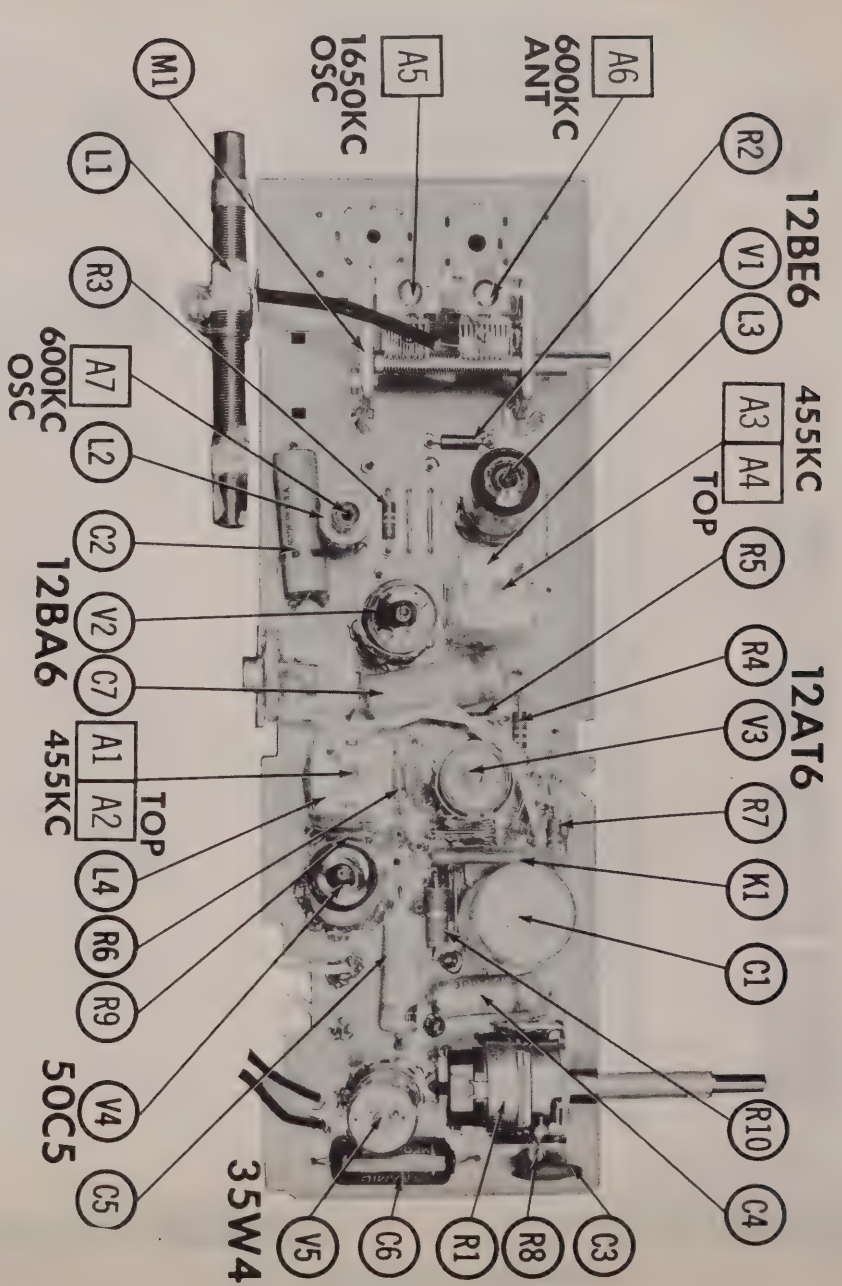
NAME	PART NO.	DESCRIPTION
Knob	740-0222	Tuning
Knob	740-0224	Volume
Knob	740-0223	Tone, Off-On
Knob	740-0225	Dummy
Pointer	792-0023	
Cabinet Front	822-0028	Includes Overlay
Cabinet Back	822-0029	Model 1303RE
Cabinet Back	822-0031	Model 1303TU
Cabinet Back	822-0033	Model 1303YE
Cabinet Top	822-0030	Model 1303RE
Cabinet Top	822-0032	Model 1303TU
Cabinet Top	822-0034	Model 1303YE

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—TOP VIEW



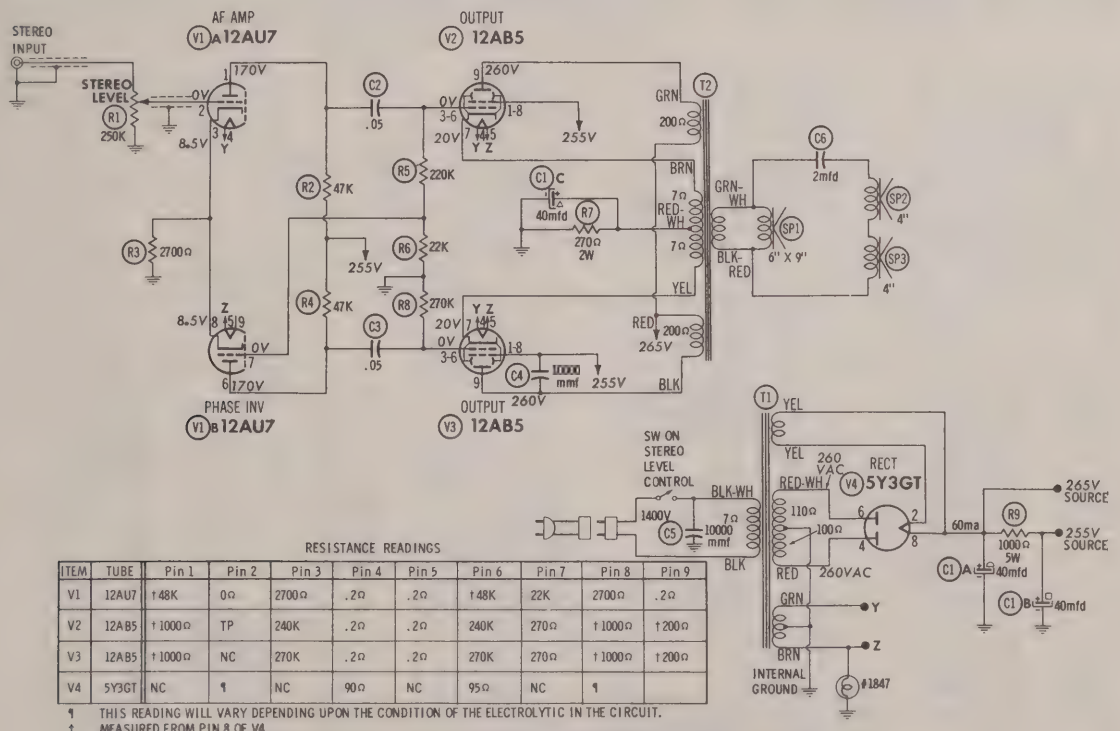
PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

WEBCOR MODEL 4923-1 (Ch. 14X275-3)

WEBCOR MODEL
4923-1 (Ch. 14X275-3)

TRADE NAME	Webcor Models BC-4923-1, CC-4923-1, MC-4923-1 (Ch. 14X275-3)
MANUFACTURER	Webcor, Inc., 5610 W. Bloomingdale Ave., Chicago 39, Illinois
TYPE SET	AC Operated 4 Tube Audio Amplifier
POWER SUPPLY	105 - 120 Volts AC, 60 Cycles RATING 47 Watts, .46 Amp. @ 117 Volts AC



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7	†48K	0Ω	2700Ω	.2Ω	.2Ω	†48K	22K	2700Ω	.2Ω
V2	12AB5	†1000Ω	TP	240K	.2Ω	.2Ω	240K	270Ω	†1000Ω	†200Ω
V3	12AB5	†1000Ω	NC	270K	.2Ω	.2Ω	270K	270Ω	†1000Ω	†200Ω
V4	5Y3GT	NC	¶	NC	90Ω	NC	95Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V4
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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WEBCOR MODEL
4923-1 (Ch. 14X275-3)

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JX350

SET 466 FOLDER 15

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amp. -Phase Inv.	12AU7	V3	Output	12AB5
V2	Output	12AB5	V4	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	WEBCOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▰40	400	30P292	AFH3-134	C1080	FP369.1	TMT-134	TVL-3744	
B	■40	350							
C	▲40	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	WEBCOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400		30P255	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C3	.05	400		30P255	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C4	10000			30P240	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C5	10000	1400		30P220	DAC-27	DD16-103	HVE16S1	2HV-110	20HKB-S1	
C6	2.0	25		30P217-1			WMF1W2E			

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WEBCOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	250K	½	31P137	B-51	A47-250K-Z	Q13-130	U44	Stereo Level
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-6	SWE-12	76-1	US-26T	Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	47K	
R3	2700Ω	
R4	47K	

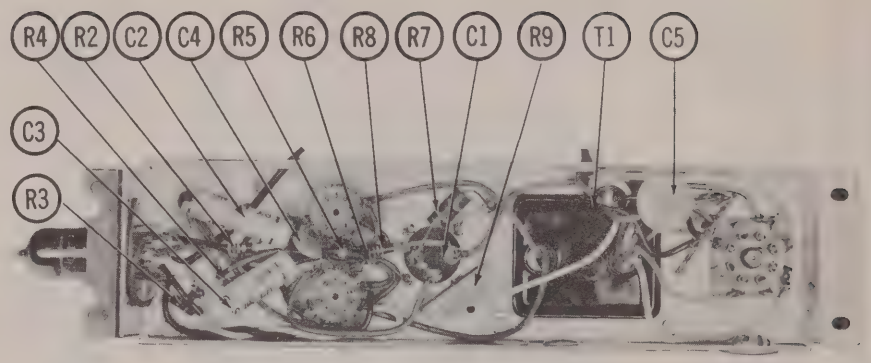
ITEM No.	RATING	REMARKS
R5	220K	
R6	22K	
R7	270Ω 2W	

ITEM No.	RATING	REMARKS
R8	270K	
R9	1000Ω 5W	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	WEBCOR PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ .46A	520 VCT Ⓐ .060A	5V Ⓐ 2A	68P050						
	SEC. 3	SEC. 4	SEC. 5							
	12.6 VCT Ⓐ .65A									

CHASSIS BOTTOM VIEW



TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.[1]	SEC.	WEBCOR PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9000Ω CT	6-8Ω	67P056							
	PRI 2									
	500Ω CT									

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	WEBCOR PART No.	QUAM PART No.	
SP1	6"x 9"	PM	6-8Ω	76P051	69A3Z7	
SP2	4"	PM	6-8Ω	76P050	4A1Z8	
SP3	4"	PM	6-8Ω	76P050	4A1Z8	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	39P148-9C	Volume
Cabinet	92X079-1	Model MC-4923-1
Cabinet	92X079-2	Model BC-4923-1
Cabinet	92X079-3	Model CC-4923-1
Leg	40P345-1	Model MC-4923-1
Leg	40P345-2	Model BC-4923-1
Leg	110X114	Model CC-4923-1

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

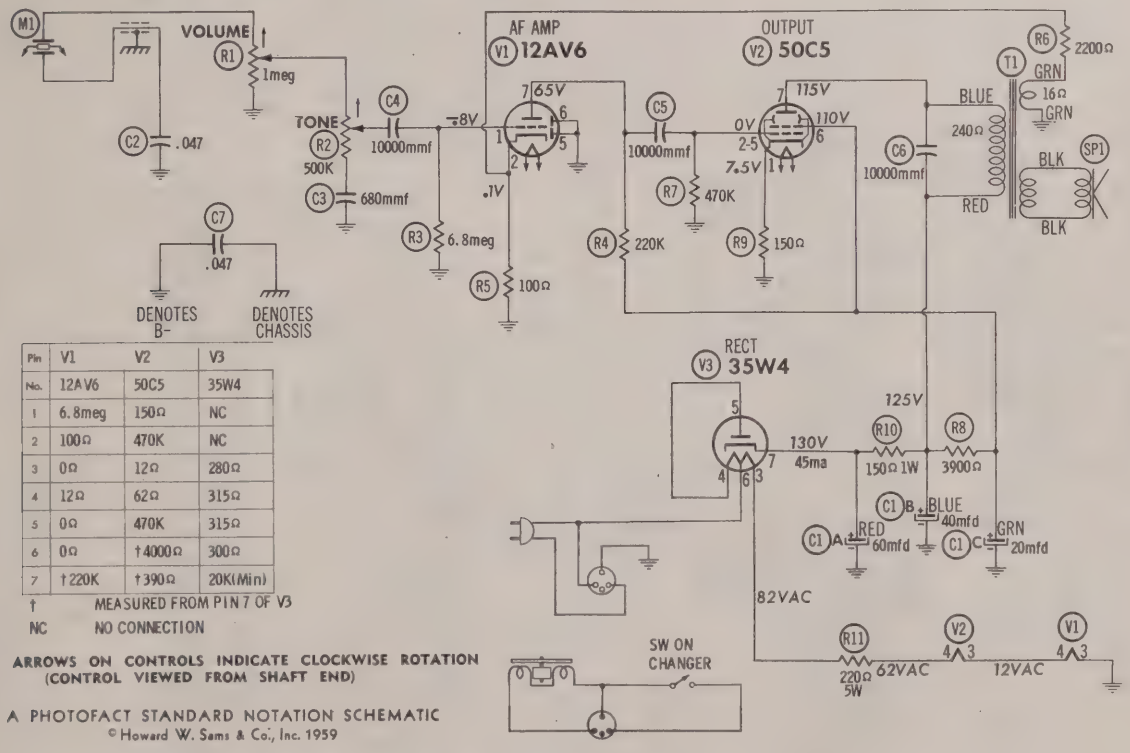
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

MODEL H-44AC1

TRADE NAME	Westinghouse Models H-44AC1, H-44AC2
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 25 Watt, .26 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1200A — PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10



Pin No.	V1	V2	V3
1	6.8meg	150Ω	NC
2	100Ω	470K	NC
3	0Ω	12Ω	280Ω
4	12Ω	62Ω	315Ω
5	0Ω	470K	315Ω
6	0Ω	†4000Ω	300Ω
7	†220K	†390Ω	20K(Min)

† MEASURED FROM PIN 7 OF V3
NC NO CONNECTION

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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WESTINGHOUSE MODELS
H-44AC1, H-44AC2

SET 466 FOLDER 16

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JS018

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1 V2	AF Amplifier Output	12AV6 50C5	

ITEM No.	USE	TYPE	NOTES
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	218V025H27	AFH3-12	C0110		TMT-11	TVL-3443	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C3	680				BPD-00068	DD-681	BYA10T68	B-368	5GA-T68	
C4	10000				BPD-01	DD-103	BYA10S1	B-110	5GA-S1	
C5	10000				BPD-01	DD-103	BYA10S1	B-110	5GA-S1	
C6	10000				BPD-01	DD-103	BYA10S1	B-110	5GA-S1	
C7	.047				P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	690V020H64	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	500K	½	690V020H62	B-59	A47-500K-S	Q11-133	U50	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R3	6.8meg			
R4	220K			
R5	100Ω			
R6	2200Ω			
R7	470K			

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R8	3900Ω			
R9	150Ω			
R10	150Ω	1		
R11	220Ω	5	690V020H51	

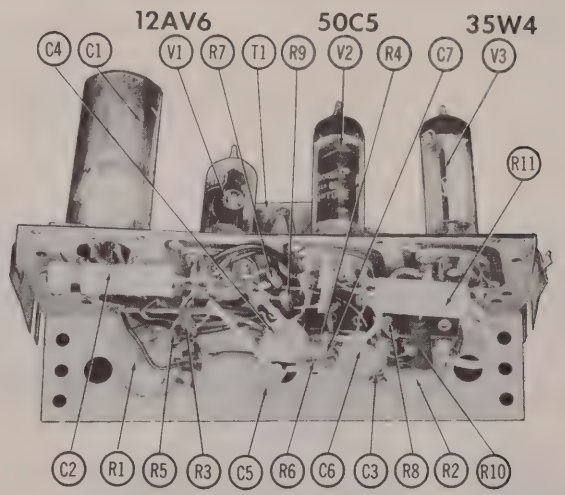
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC. 1	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2900Ω	115Ω	690V020H60							
		SEC 2								
		3-4Ω								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	SP-609①	6A21	① Includes High Frequency Dispersing Cone

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA									
	Westinghouse PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	0V-400	118-TS	N8-1 & N8-3			3	CRA-55 or CRA-55D and CRA-55LP or CRA-55LPD		

ASTATIC AND JENSEN NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Westinghouse PART No.	JENSEN PART No.	WALCO PART No.	
M2	R0-250 (78RPM)	† CRA-55 or ♦ CRA-55D	† W-64S or ♦ W-64D	† Jewel ♦ Diamond
	R0-100 (LP)	† CRA-55LP or ♦ CRA-55LPD	† W-64MGS or ♦ W-64MGD	

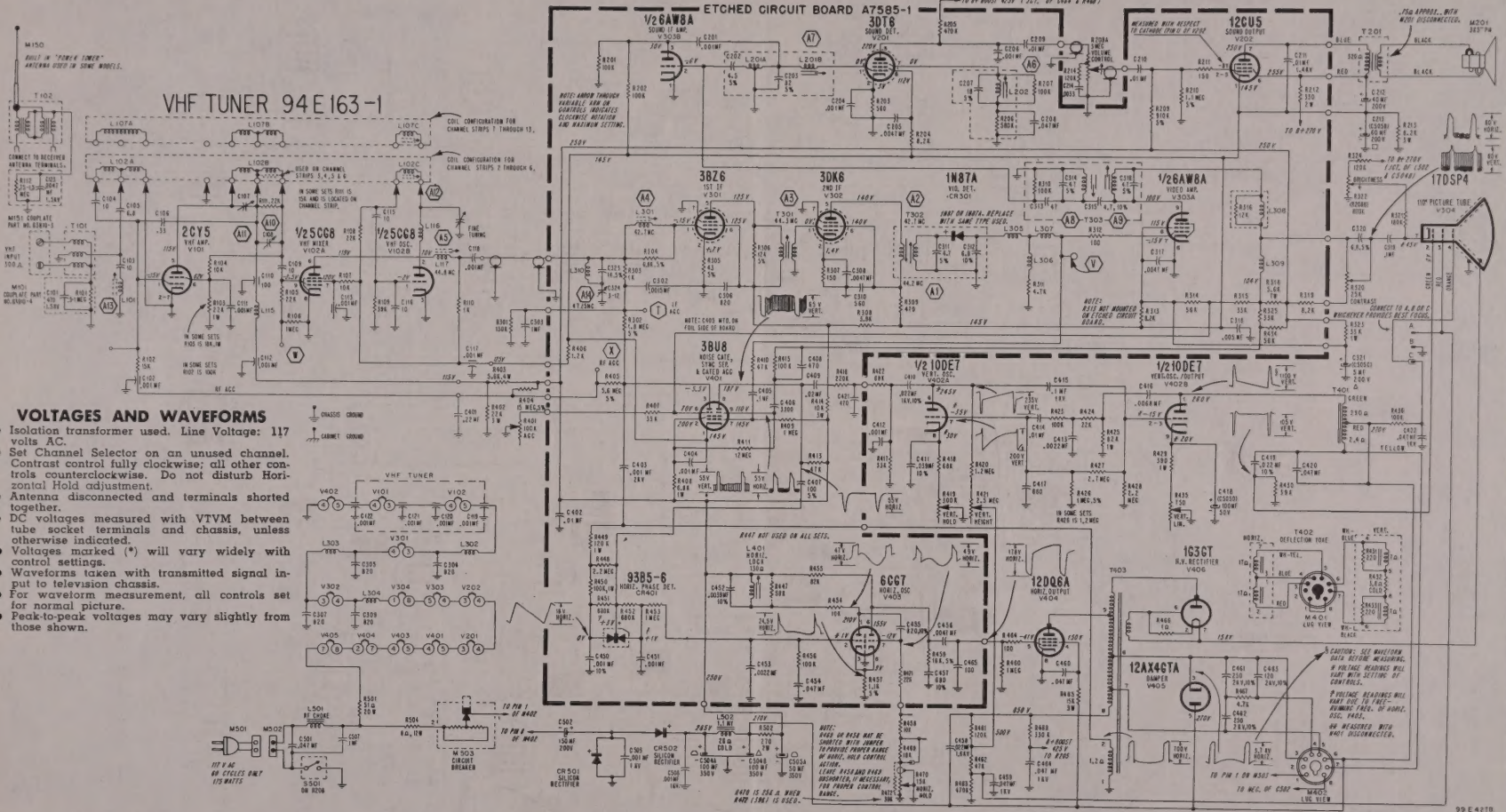
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	690V020H40	Volume, Tone
Cabinet	690V020H09	Silver, Black And White, Model H-44AC1
Cabinet	690V020H10	Silver, Red And White, Model H-44AC2

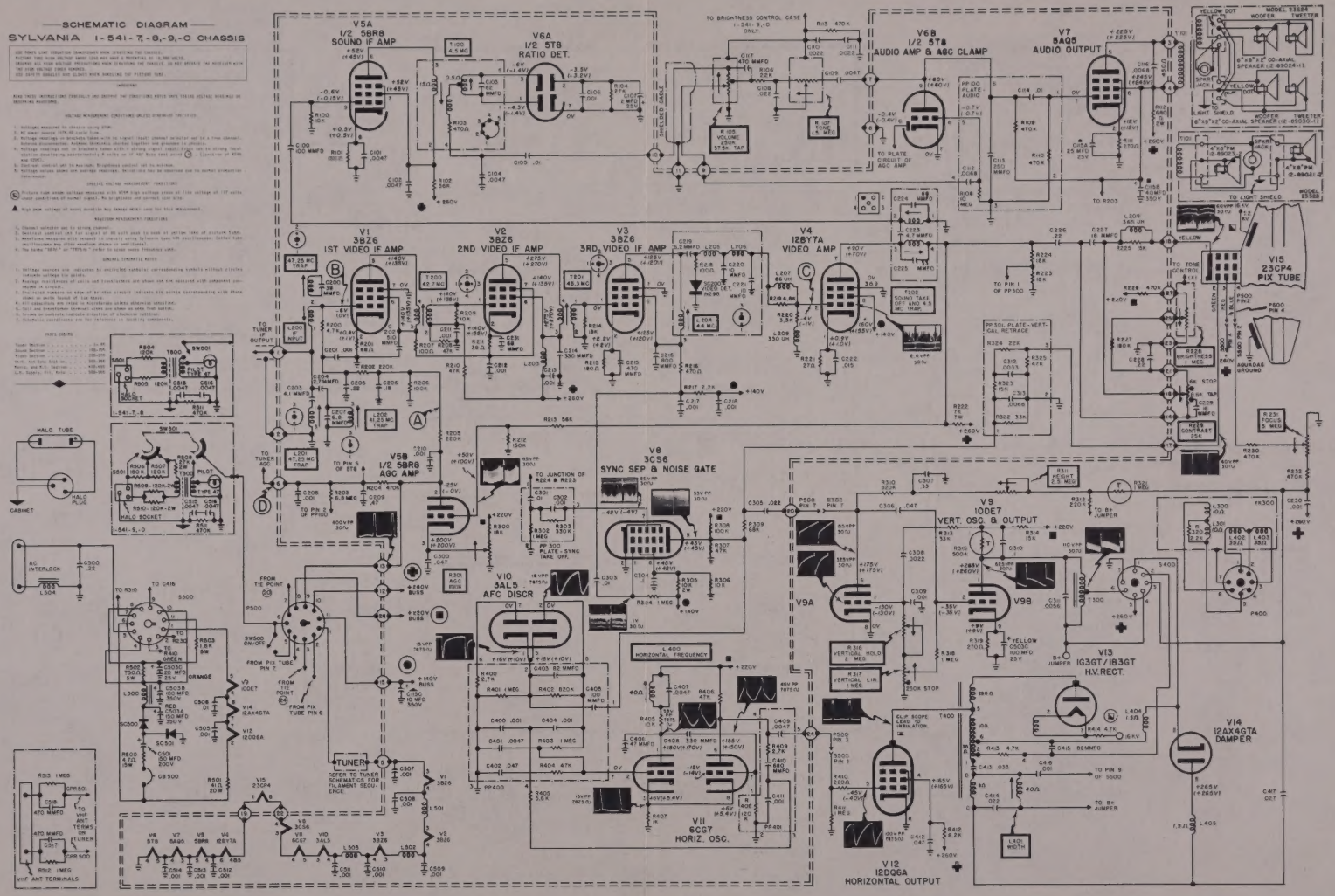
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



ADMIRAL MODELS PL17F31B, PL17F32B, PL17F33B, PL17F41B, PL17F42B, PL17F43B (CH. 15D1B)

Schematic Diagram Courtesy of Admiral Corporation


SCHEMATIC DIAGRAM
SYLVANIA 1-541-7,-8,-9,-0 CHASSIS
V5A 1/2 5BR8 SOUND IF AMP
V6A 1/2 5T8 RATIO DET.
V6B 1/2 5T8 AUDIO AMP & AGC CLAMP
V7 6AQ5 AUDIO OUTPUT
V1 3BZ6 1ST VIDEO IF AMP
V2 3BZ6 2ND VIDEO IF AMP
V3 3BZ6 3RD VIDEO IF AMP
V4 12BY7A VIDEO AMP
V15 23CP4 PIX TUBE
V5B 1/2 5BR8 AGC AMP
V8 3CS6 SYNC SEP & NOISE GATE
V9 10DE7 VERT. OSC. & OUTPUT
V10 3AL5 AFC DISCR
V11 6GG7 HORIZ. OSC.
V12 12DQ6A HORIZONTAL OUTPUT
V13 1G3GT/1B3GT H.V. RECT.
V14 12AX4GTA DAMPER
HORIZONTAL FREQUENCY
VERTICAL HOLD
VERTICAL LIN
HALO TUBE
CABINET
HALO PLUG
TUNER
REFER TO TUNER SCHEMATICS FOR FILAMENT SEQUENCE.

SYLVANIA MODELS 23S23, 23S24 (CH. 1-541, -7, -8, -9, -0)

Schematic Diagram Courtesy of Sylvania Electric Products Inc.

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